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## Personals

## A FEDERAL NARCOTIC DICTATOR NOT NECESSARY—BUREAUCRATIC CONTROL OF MEDICINE WILL PROVE A CALAMITY

There are two narcotic bills before the House of Representatives in Washington, known as House Bills H. R. 9053 and H. R. 9054. (Porter Bills.)

The United States has no need of additional prohibitive narcotic drug legislation. There is ample statutory enactment to prevent any illegitimate infringement upon the necessary and legitimate dispensation of narcotic drugs. Elsewhere in this issue are cited authoritative figures proving that drug addiction is less prevalent than the lay mind is being told through biased and untruthful as well as unscientific propaganda.

The Committee on the Cost of Medical Care and other narcotic research authorities state that the drug addicts in the United States approximate a total of 100,000 persons (less than one per cent. of the total population). Also that doctors, druggists, dentists and veterinarians play absolutely no part in the spread of drug addiction.

In fact, drug addiction is an underworld proposition. In supervision, regulation and possible abolition of the underworld traffic in drugs lies the solution of the problem, and the prophylactic kernel of the whole proposition.

From which it is plain to be seen that if any narcotic drug laws are needed these should be aimed at the underworld and not at a scienitfic body of citizens such as doctors, druggists, dentists and veterinarians. The purposed Porter bills would seem to be aimed directly at the medical and allied professions. As a matter of fact the narcotic drug legislation now on the statute books more than covers the proper distribution of narcotic drugs, but what this legisla-

tion needs is enforcement. Not more enactment but far more enforcement of what has been enacted is the crying need of the hour.

The supply of narcotic drugs used to satisfy addiction is smuggled into the country in direct violation of the laws now on statute books. To apprehend these violators of the law rather than to make new laws to hamper the medical profession in its labors for sick and ailing humanity would seem to be the indications of wisdom.

There is no need of further restriction on the legitimate use and distribution of narcotic drugs for necessary and proper medical purposes. The Harrison Narcotic act and the federal narcotics control board established by the Narcotic Drugs Import and Export Act attends to that even more extensively than is needed. Yet Congressman Porter's two bills, respectively H. R. 9053 and 9054, will remodel the Harrison Narcotic act and abolish the federal narcotics control board, as well as add still another "bureau" to the already large and ever increasing army of "bureaus" at that growing seat of centralization, Washington, D. C. Further the Porter bill, or bills, will have at the head of this bureau with its sole authority to determine who shall or who shall not be permitted to prescribe and dispense narcotics for medical purposes, a "commissioner of narcotics," whose powers will be czaristic in the extreme.

For among other capacities this "Commissioner" will be empowered to

1. Fix an arbitrary limit to the amount of narcotic drugs that may be produced or imported within a calendar year, thus automatically abolishing the now authorized federal narcotics control board with representatives from three distinct and separate departments of the federal government.

2. Wield autocratic power in issuing withholding or revoking licenses previously issued; a most absolute dictum since the bill provides also that no license for the importation or manufacture of any narcotic drugs shall be issued, or if issued such license may be suspended or revoked if the commissioner finds that such license is not necessary to supply the medical and scientific needs of the United States.

3. Act without explanation of his reasons. The commissioner according to the bill, with respect to the issuance, suspension or revocation of a license need merely give written notice to the applicant or licensee to show cause why the license should be issued; or in case a license has been issued, why such license should not be revoked. By this reversal of procedure the bill, through its commissioner, lays the burden of proof for fitness upon the applicant or licensee. In case of a producer or importer proof must be furnished that the drugs being manufactured or imported are actually and immediately needed. And upon the caprice of the man who may be serving temporarily in the office of commissioner of this new bureau, any and all such licenses may be issued, withheld, suspended. or revoked.

4. Hearings before the commissioner or his delegated agent and witnesses who may testify at these hearings are an arbitrary matter within the hands of the commissioner or his delegated agent as to time, place, witnesses and other details without any regard to the rights or convenience of the applicant or licensee.

5. No provision is made for the right of appeal from the commissioner's decision other than the right of any aggrieved citizen for appeal known as his civil constitutional right and which is patently and admittedly an expensive and long delayed method of disputation when involved with an official of the government. In fact, in the minds of the average citizen, a hopeless if not a lost cause.

6. Any officer or employe of the commissioner may be assigned to hold hearings; determine whether these shall be public or private and issue subpoenas for the production of witnesses, books, papers and documents. The applicant and licensee cannot have a witness unless the commissioner knows why and what the witness will testify.

7. No matter who conducts the hearing, evidence may be passed upon by the Commissioner alone and on this forwarded transcript of testimony and the documentary evidence, sight unseen and all unheard, the Commissioner makes the final decision. No provision is made for suspending the operation of the commissioner's decision, pending a decision by the court on any appeal made against the decision of the commissioner.

The Porter bill makes no provision for the en-

forcement of the Harrison Narcotic Bill, an enforcement which, as is previously stated, if it were adequate would practically wipe out the narcotic drug problem. Unfortunately most propagandists and proposers of theoretic legislation prefer to make laws that are to be inflicted upon the law-abiding rather than the law-breaking classes, and their demands for "reform" legislation are based primarily on appeals to the emotions rather than on appeals to common sense and hard boiled facts. Some very sensational newspapers are flooding their columns with harrowing tales of the ruins resulting from drug addiction.

There are few things under the heaven and on the earth more pitiable than a fine brain and a fine body gripped by the perniciousness of the drug habit. But drug addicts in the United States, or anywhere else, are not made in doctor's offices nor through the channels of legitimate practice. There is no disputation as to the value of narcotic drugs both in the prolonging of life and the palliation of pain, and when handled under scientific conditions no ill results. That the discretionary power of administering these drugs should be taken out of the hands of science and put into the hands of politics and ignorance is unthinkable. What is needed is less brass band and more pick and shovel. If the emotionalists who want to practice medicine by bossing medical practitioners through laws and laws and more laws, would stop making a cry for more legislation and devote their talents to a demand for more enforcement the truth might have a chance to work for the good of the public weal.

Unfortunately making a law does not enforce a law, any more than setting out eggs, flour, fat, sugar, milk, and baking powder on a table compounds a cake for supper.

Again, the Porter bills give the newly proposed commissioner all the rights in the world and hamper him with practically no restrictions. He is not hampered in any way by any previous law governing any state in which he may care to set about his czaristic way. The issuing, suspension and revocation of licenses is a plaything for his hands alone. State rights, state police powers, state welfare, state medical boards are but a puff of thistle-down before the commissioner's ideas, as to what makes an addict and what to do to him and with whom to do it. And meanwhile physicians, pharmacists, dentists and veterinarians must keep right on also paying taxes and making registrations with the Commissioner of Internal Revenue for the obligations of the Harrison Narcotic act.

From the powers vested in the commissioner of the new Porter bill it would seem to be rather difficult to find a man so omnipotent as to be able capably to administer the tasks assigned.

Now there are only two limitations to these powers of the commissioner. His authority is subject only to the right of the Secretary of the Treasury to approve or disapprove such regulations as the commissioner may propose, and to the right of the courts to review final action by the commissioner.

A narcotic addict can not be licensed, and it lies within the jurisdiction of the Commissioner as to when a person becomes a narcotic addict, when he is one, and when he ceases to be one!

Further, once a license is revoked, it must stay revoked. AND NEVER THEREAFTER CAN A MAN WHOSE LICENSE HAS BEEN REVOKED USE NARCOTIC DRUGS PROFESSIONALLY AS NO NEW LICENSE CAN BE ISSUED!

Remember this revocation lies at the discretion of the commissioner. And no matter how trivial an offense against a state or federal law dealing with narcotic drugs, may be laid up against a man, if he is convicted or has been convicted of it, he can never be licensed and if he has a license it can be revoked.

Under the Porter bills this commissioner would be a one-man version of the cheka without any thought of the rights of the sick and ailing among the 120,000,000 residents of the United States.

H. R. 9053 (PORTER BILL) IS BEFORE THE WAYS AND MEANS COMMITTEE OF THE HOUSE OF REPRESENTATIVES. MEMBERS OF THE COMMITTEE FROM ILLINOIS ARE CARL R. CHINDBLOM AND HENRY T. RAINEY.

H. R. 9054 (PORTER BILL) IS BEFORE THE COMMITTEE ON FOREIGN AFFAIRS. THE MEMBER OF THE COMMITTEE FROM ILLINOIS IS MORTON D. HULL.

Doctors should write the members mentioned

protesting against the passage of the Porter Bill. Send your communication directly to the members at Washington, D. C., care of House of Representatives.

## MEDICAL PROFESSION NOT RESPONSIBLE FOR DRUG ADDICTION

The Porter Bills (H. R. 9053 and 9054) are before Congress. Further regulations on the narcotic problem so far as the medical and allied professions are concerned are unnecessary and uncalled for.

To make the medical profession the national scapegoat seems to be the current favorite indoor sport. Every ill from the alleged operating for fees instead of for ailments to the manufacturer of drug addicts is placed without rhyme or reason at the door of the medical profession. Such false and unjustified slander against the body of self-sacrificing, underpaid professional men should be stopped.

Both in and out of season the editor of the ILLINOIS MEDICAL JOURNAL has published editorial after editorial in defense of the medical profession. Relative to the part played by the doctors in the causation of drug addiction see ILLINOIS MEDICAL JOURNAL, April, 1927.

This editorial was prompted by a statement of a Judge of the United States Federal Court of Illinois before the Taylorville Rotary Club where he stated, that "2,500,000 addicts in the United States were made by the practice of medicine." The impression is quite universal among the laity that there are millions of addicts in the United States made by the practice of medicine.

The number of addicts in the United States are comparatively few, as evidenced by the following statistics. The committee on the cost of medical care has completed two years of its five year program of investigation and has issued a summary of the work accomplished. In one of the interesting pamphlets just published they set forth their findings on addiction as follows:

"There are in the United States about 110,000 drug addicts" (less than one per thousand).

L. G. Nutt, chief of the narcotic division of the United States, on Dec. 11, 1926, estimated that there were 100,000 addicts in the country. As this is Chief Nutt's especial field of investigation it would seem that he would be better able to give the number of addicts in the United States than any other man. Mr. Nutt in giving this estimate before the House Committee on Appropriations added that his "estimate was based on a survey by 300 field agents engaged in this work, who mingled with the underworld and consulted physicians and city authorities and others."

Mr. Nutt added that 98 people are employed in the anti-narcotic work at the headquarters at Washington, and the total number of employes there and in the field is 333: that last year they had brought about 5,120 convictions, with total collections from the violators of the law, including fines of $981,739.

May 23, 1924, *Public Health Reports,* in a brochure, "The Prevalence and Trend of Drug Addiction in the United States and Factors Influencing it," quotes from surveys of the States of Tennessee and Pennsylvania and from the United States Army and the Treasury report. The maximum probability of drug addicts in any of these findings was placed at 269,000 or about ten per cent. of the statement of Judge Fitzhenry.

Mr. Nutt's estimate of course is less than one-twenty-fifth of what the Bloomington judge lays upon the country's population.

In the Tennessee survey made by Lucius P. Brosn, State Food and Drug Commissioner, as he was able to register 2,370 addicts he estimated the maximum number as not exceeding 5,000 in the state. Using these figures as a basis he estimated 215,000 in the entire country.

The treasury department survey under the secretary of the treasury, conceded the most comprehensive survey made up to that time; claims there were not over 237,655 addicts in the United States.

The Pennsylvania survey was made under the State Bureau of Drug Control. As in five years this bureau collected the names and addresses of drug addicts in Pennsylvania and obtained less than 9,000 names, the chief of the bureau estimated that there were not more than 20,000 addicts in the state; that on this basis there would be approximately 242,000 addicts in the United States.

The United States Army findings were based on a survey of all men in the draft age and found there were only 3,284 drug addicts. If the army rate is applied to the entire United States based on the 1920 census there would be approximately 99,500 addicts.

Clinical reports were made by revenue agents of the 44 clinics supervised by the internal revenue department, 34 of which contain statistical information on addiction in large cities in California, Connecticut, Georgia, Kentucky, Louisiana, New York, North Carolina, Ohio, Rhode Island, Tennessee, Texas, and West Virginia.

These clinical statistics show that there were 4,123 addicts in 34 cities having a total population of 4,182,952 or 0.98 addict per 1000 persons. At this rate there would have been in America 104,300 addicts in 1924.

New York City clinic not included in the cities in states above mentioned registered 7,464 addicts. Using the 1920 census as a basis of computation the New

York City rate would give approximately 140,000 addicts for the entire country.

Applying the New York rate to the entire country would be absurd. New York is the largest port of entry in the United States and is the clearing house for the whole world and naturally the percentage of addiction in New York far exceeds that of any other city and applying the same yard stick to New York as to other sections of the country is ridiculous.

Using the U. S. *Public Health Reports* of "May 1924" yields the maximum estimate 269,000 and a minimum estimate of 99,500 addicts in the U. S. with various estimates between these two figures.

Mr. Nutt added, "Of the hundred thousand non-medical addicts in this country, and by non-medical addicts I mean addicts that take it simply to gratify the habit, nearly all acquire their supply through bootleg channels because the doctors will not prescribe it except occasionally."

Although the usual disposition of the addict is to shift the responsibility for his affliction to others, and to justify himself for his habit, less than one per cent claim the addiction is due primarily to physicians eventuating from a necessary treatment for disease.

Let it be repeated, that according to statistics and surveys the United States government officials and health departments unite in the finding that physicians play an inconspicuous part if any in the causation of drug addiction.

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## MENACE OF OVERSTANDARDIZATION OF CARE OF THE SICK AND HOSPITALIZATION AND EXPLOITATION OF THE DOCTOR

There is a great deal of unrest on this topic that is prevalent in many sections. We have received much complaint. The most recent protest dealt with certain matters in a northern Illinois hospital and where because of an attempt at superstandardization there resulted an unfair discrimination as to patients. The feeling of resentment voiced in this protest appears to be universal throughout the United States. Much of this complicated situation it would seem might have been avoided, had installation of this system of standardization been effected throughout under the supervision of the A. M. A.

The sad but familiar trick of making the method of far more importance than the result is cropping up again in the tendency towards too much standardization in hospitals.

After all it is the physician who is treating the sick and it is his regime rather than the height of baseboards or the average weight of the nurses that is the great essential.

The human tendency to exploit and to exalt the part at the expense of the whole is no place more glaring than in the treatment of the sick where the standardization of hospital shows signs of being held of greater necessity than the urgencies of the patient.

In this respect no better word has been said than by Dr. M. L. Harris, president of the A. M. A.

Quoting Dr. Harris in part:

"It should be the duty of all physicians who are actively concerned with hospital work to see that the primary purpose of the hospital—namely, the care of the sick—is not diverted or minimized by the prevailing passion for so-called standardization, which seems to have obsessed so many organizations and institutions today. Hospitals are being flooded with elaborate questionnaires, some of them asking questions which no self-respecting institution would answer, such as the names and salaries paid its superintendent and other employees, and the names and particular religion of the members of the staff, and are being overrun by young inspectors who have no knowledge of, or experience in, the management of hospitals, each with an arbitrary yardstick with which to measure and rate the hospital according to the dominant idea of the institution doing the rating. One will rate the hospital on the basis of its physical equipment; another on its scientific paraphernalia; a third on the percentage of autopsies held on the dead; a fourth on the number of beds and its facilities for training interns; a fifth on the willingness of the members of the staff and all others practicing in the hospital to sign an iron-clad stultifying oath concerning fees, which it is acknowledged cannot be enforced and which, as is well known, is constantly being violated by a large percentage of its own memmbers, and so on down the list, while no one seems to have grasped the idea of rating hospitals according to the amount of good they are doing in the relief of human suffering, having in mind the economic conditions of the community served.

Physicians must have strength of character enough to assert themselves in the management of hospitals. They must be imbued with the high ethical principles of the profession and see that all those who work with them are likewise ethical. This is a duty they owe to themselves, their profession, their patients and the public."

On this subject, quoting further, an editorial from the *Indiana State Medical Journal* for Oct., 1929, remarks in part:

### OVERZEALOUS HOSPITAL STANDARDIZATION

"No doubt hospital standardization has worked to the benefit of hospitals, physicians and public, but there is such a thing as carrying a good thing too far. One of the points that must be emphasized to hospital man-

agers is the fact that the physician is responsible for the patient and if anything goes wrong it is the physician and not the hospital that first comes in for censure. Therefore the physician's judgment and his wishes, within reason, must be respected. Then if the attending physician desires to have laboratory work done for his patient who has been hospitalized he will order it. *The hospital should not go over the head of the attending physician and do a lot of laboratory work on its own initiative, always at the expense of the patient, much of which may be positively superfluous as well as useless.* To follow such a course of action may be one of the rules of hospital standardization, but it is an idiotic rule and physicians who send patients to hospitals should object emphatically. In the first place the physician should be competent and trusted or else not admitted to the hospital as an attending physician, surgeon, or specialist. In the second place, if he is trusted then he should be permitted to use his judgment as to when and how much laboratory work is to be done for *his* patient, and it can be taken for granted that he has more interest in the patient than has any hospital, and his judgment probably is better than that of the hospital management as to when laboratory work is indicated. If the hospital is doing unnecessary and superfluous laboratory work on the plea that it is for the protection of the hospital (?) then let it be known that the patient will *not* be charged for the service. There has been much complaint about the attempt on the part of the management of some hospitals to take too much charge of the patient and to do too much dictating to physicians as to the kind and amount of treatment to be given the patient. *Those hospitals should turn over a new leaf and permit the physician to do the practicing, and, on the other hand, the physician who is held responsible for the treatment and care of his patient in the hospital should be permitted to have that control and not be subjected to unfair dictation on the part of hospital managements."*

## DR. CABOT DISMISSED AS MEDICAL DEAN OF UNIVERSITY OF MICHIGAN —A MEDICAL DEPARTMENT OF A UNIVERSITY SHOULD NOT COMPETE WITH ITS OWN GRADUATES

At last one certain step at least seems to have been taken to erase from the scientific practice of medicine the deep-dyed stain upon the justice of ethics involved by the tendency of tax-supported medical educational institutions to enter into practice in direct competition with their own alumni, as well as with practicing physicians the country over.

There is an old and homely saying: "Give a calf rope enough and it will hang itself." The Old Testament voices this same sentiment with more dignity in discussing the tilt at arms between Haman and Mordecai when at last "There was Haman—on a gallows fifty cubits high"—or in modern words, "hoist by his own petard."

Now the state of Michigan is one of the forty-eight States in the Union where menacing tendency to state medicine flourishes under cover of legislative protection. To all of which it would seem that not only has a portion of the faculty of the medical school of the University of Michigan been subscribing a more or less fervent "Amen" but to tell the truth some of the members would seem to have tacitly sanctioned many such revolutionary and un-American movements that were based upon the invasion and pre-emption of individual rights of some one person or class. Among such movements must be mentioned the lay dictation of the practice of medicine or the intrusion into this practice of medicine of corporations, especially tax supported corporations.

The medical profession of the state of Michigan has at last made audible its murmured protest. Dr. Hugh Cabot is no longer dean of the medical school of the University of Michigan.

What welcome news this announcement must have been to the hard-working, earnest doctors in the state of Michigan! It has been an open secret this long time that Dr. Cabot's paternalistic ideas and theories—the policies conceived and put into operation by Dr. Cabot, have not met with popular approval of physicians in general either in or out of Michigan, nor by the very faculty of the school, of which he is a member.

This usurpation of the privileges of medical practice by a body corporate designed and instituted by that very body of taxpayers through whose labors and tithes it is supported, for the functions of teaching and research, under and post-graduate, and by an especial extension of purpose as a bureau of consultation for practicing physicians has been an outrage against ethics and justice mounting into octopus strength.

No medical school remains within its rights and jurisdiction when it encourages a clinical practice either for the purpose of whole or partial self-support. The only leeway allowable from its main or educational purpose is such clinical practice as may be indicated for the care of the indigent and as clinical material for the purpose of the teaching of the practice of medicine in

complement to the teaching of the theory of medicine. *Whoever heard of a college of law entering into paid legal practice?* What a howl and uproar would emanate from the entire judiciary from the respected Supreme Court of the United States to the cheapest "ambulance chaser" who ever sullied a sheepskin.

In this connection one can do no better than quote the dispatch sent out by the Associated Press and briefing the news of the situation, as appeared in the *Chicago Herald-Examiner* under date of Feb. 7, 1930:

OUST CABOT AS MEDICAL DEAN

ANN ARBOR, Mich., Feb. 7.—The board of regents of the University of Michigan this afternoon relieved Dr. Hugh Cabot, dean of the medical school, of his duties as dean, but continued him as professor of surgery.

The ouster was a result of a split between Dean Cabot and members of the medical school faculty over whether doctors who were paid by the staate should also be allowed to have private practices outside. Dean Cabot held that all members of the faculty should devote their entire time to teaching.

The dean also held that the University hospital should be open to private patients with fees paid to the university. Members of the faculty supported by the Michigan State Medical Society held that acceptance of patients who were able to pay for treatment by the university hospital takes practice away from the doctors of the state.

The regents first asked him to resign, which he refused to do. A committee of five will be appointed by President Ruthven to administer the affairs of the school for the present."

The support and the co-operation of its state university are the meed and due to any corps of physicians practicing in any state. Any medical alma mater should be loyal to its alumni and the alumni should be loyal to the alma mater. "Noblesse oblige," on both sides.

In any state where conditions maintain such as have beset Michigan doctors, such loyalty becomes drowned by injustice and usurpation of rights and privileges of individualism such as is nothing less than rank robbery.

It is appalling to remember how long protests of organized medicine against this procedure on the part of universities and corporations practicing medicine have been refused that democratic spirit of serious consideration expected from a public servant.

Dr. Cabot's successor must be chosen with care. He must be a man worthy of his high position as educator and executive and blessed with the intelligence and the diplomacy to set a value upon the good will and the good opinion of the medical profession in the state of Michigan first, and, secondly, in every other state of the union.

## LORD CHIEF JUSTICE OF ENGLAND DISSERTS ON GROWING MENACE OF BUREAUCRACY — HIS CRITICISM FURNISHES FOOD FOR THOUGHT TO THE AMERICAN PUBLIC, AND ESPECIALLY TO MEMBERS OF THE MEDICAL PROFESSION

### Bureaucracy Wherever Found Is a Menace —When Applied to the Practice of Medicine It Is Fatal

The book of the hour in England is written by Lord Hewart, Lord Chief Justice of England, and appears under the title of "The New Despotism." By "the New Despot" the lord chief justice means that hampering bureaucracy, spreading like pursley throughout the civilized world, and that is really but clever camouflage for a steadily encroaching socialism.

The United States is admittedly the worst law-ridden country in the world, yet even England is beginning to feel the pinch of bureaucracies. Poor England! Suffering already under the panel system of doctors and state medicine. What is going on in England in behalf of bureaucracy is proceeding at a double quick in America. Because of this, F. G. Bettany's epitome of Lord Hewart's volume, quoted from the *London Bookman*, December, 1929, furnishes food for thought to the American public, and especially to the members of the medical profession, a group of men protesting even now at being made the catspaw to pull political chestnuts out of the fire. For "Government" read "Federal," for "Ministers" read "Legislators," for "Parliament" read "Congress."

Writes Mr. Bettany:

"It is a novelty to find a Lord Chief Justice of England stepping down from his Bench to make a direct appeal to the nation against the encroachments of the Executive. But the case is urgent, as the Government would seem itself to admit by the appointment of a Committee on the subject one day in advance of the issue in book form of the distinguished judge's indictment,

and Lord Hewart deserves the thanks of the community for the courage and public spirit he has shown in thus directly challenging and exposing the threat to liberty involved in "The New Despotism." The "despot" he arraigns is the bureaucrat or departmental official, and the menace to the alarming growth of which he calls attention is so-called "administrative" or department legislation. His is no solitary cry on this theme; it is but the climax of protests which have come from many other of our judges who long have complained of the present-day tendency not only to invest the executive with legislative powers but also to oust the control of the regular courts and make the bureaucracy judge in its own cause.

It will startle most readers of Lord Hewart's book to learn that what he calls "delegated" legislation has in recent times enormously exceeded the amount of direct legislation by statute. We have grown up in the belief that Parliament enacts our laws and that zealous M. P.'s keep careful watch over the provisions and wording of any new measure. Today that is largely an illusion. The majority of modern bills are introduced by Ministers at the instance of their Departments; in such measures Ministers enumerate certain principles or intentions, and claim carte blanche in the matter of details and application. They secure powers to issue rules applying their Bills, which are of course framed by some departmental official. Having prepared this Bill in skeleton form, the official fills in the gaps with his own orders. More than that—by ingenious phrasing he secures for them the force of statute, makes his own decision final and prevents any sort of appeal to a court of law. The slipping into the Bill of some clause in an obscure subsection will do the trick, and so orders and regulations have been made behind the back, without the control and without the real assent of Parliament, and the Courts have been deprived of the right to inquire whether the rules were or were not *ultra vires.*

*In this way a remarkable constitutional change is being effected by our bureaucrats without the public being conscious of its progress and with Parliament too distracted as a rule by party regimentation to detect the danger. Governments of various complexions have sanctioned or been victimized by these departmental encroachments.* Whips hurry through Government Bills on the last days of a session when members are too jaded to keep their eyes open for the minutiae of legislation. And so, with the piling up of new laws and the congestion of the supposed law-making machine, power is passing from Westminster to Whitehall. "A mass of evidence," says Lord Hewart (and he quotes is extensively), "establishes the fact that there is in existence a persistent and well contrived system intended to produce, and in practice producing, a despotic power which at one and the same time places Government departments above the sovereignty of parliament, and beyond the jurisdiction of the Courts." Lord Hewart, it has been suggested, has too high an esteem for Parliament. Certainly Whitehall does not err on that side. Its departments are full of experts, and experts, here as elsewhere, have a poor opinion of Parliamentary institutions. The rule of Law in their opinion has been a failure; the rule of the expert, which would be both scientific and benevolent, would prove a vast improvement. With the best intentions then they are seeking to bring about the change.

One accepts Lord Hewart's indictment of the "new despotism" because there is no alternative to doing so; he proves his case up to the hilt. The statutes and regulations he gives at length furnish irrefutable testimony. Here is the customary clause by which the bureaucrat filches control: "If any difficulty arises in connection with the application of this Act . . . the Minister may by order remove the difficulty, and any such order may modify the provisions of this Act, as far as may appear to the Minister necessary or expedient." Read for "Minister" the bureaucrat behind him. Further we find in some cases an enactment that "the Board may confirm the order . . . and the confirmation shall be conclusive evidence that the requirements of this Act have been complied with, and that the order has been duly made and is within the powers of this Act." So the bureaucrat prevents an appeal against himself to the judges. He has even tried, the Lord Chief Justice shows, to subordinate the judges to the departments, and compel them to give opinions beforehand on hypothetical cases; and Lord Hewart urges that, not con-

tent with this blow at judicial independence, the bureaucrat, by his calls for a "Minister of Justice," who would make appointments to the Bench, aims at reducing the judges to a branch of the Civil Service. His wrath on this point can be readily understood, but here he is only dealing with surmise. In the rest of his attack on the "new despotism" he is handling facts—facts so formidable that the mere recital of them ought to insure a remedy.

## DR. JOHN E. TUITE, OBITUARY

Dr. John E. Tuite, aged 65 years, president of Illinois State Medical Society in 1928-1929, died at his home in Rockford, February 26, of a complication of diseases of the bladder. He had been in ill health for about a year but had been active up to two weeks ago.

Dr. Tuite is survived by his wife and a daughter, Margaret, and a son, Dr. John F. Tuite, Jr.

Dr. Tuite was born in Clark county, O., July 20, 1864. He was graduated from St. Ignatius College, Chicago, in 1887. A year later, however, he was ordered to rest for his health and he went to San Antonio, Tex., where he became interested in the shoe business.

In 1892 he came to Rockford, where he started a shoe factory. His medical ambition remained, however, and he returned to Rush college, from which he was graduated in 1900. He began the practice of medicine here the same year.

In 1889 Dr. Tuite married Frances Schmauss of Rockford. She died in 1900, leaving him with a son and daughter. In 1908 he married Helen Emma McSweeney of Rockford.

Besides his membership and office in the state association Dr. Tuite was also a member of the American College of Surgeons.

## DR. P. J. H. FARRELL A CANDIDATE FOR CONGRESSMAN-AT-LARGE

We call your attention to the fact that Brig. Gen'l (Doctor) P. J. H. Farrell of Chicago is a candidate for Congressman-at-large for a seat in the National House of Representatives. The country has had suffering enough from vicious legislation planned by laymen to interfere with and dictate the practice of medicine.

In the name of humanity and progress let a few physicians have something to say about legislation. Congress is made up largely of lawyers, there are only a few physicians in the national body of lawmakers. Yet the doctor comes closer to the problem of the average citizen than any other professional man.

Dr. Farrell is a candidate (Republican) for Congressman-at-large from the State of Illinois. He is capable, efficient and experienced. For the good of the country we should have several medical men representing us both in Springfield and at Washington.

Go to the polls Primary day, April 8, and vote for Brig. Gen'l (Doctor) P. J. H. Farrell.

## DOCTORS WISHING TO READ PAPERS BEFORE THE SECTION ON RADIOLOGY AT THE STATE MEETING

Doctors wishing to present papers before the State Society meeting to be held at Joliet, May 20-22, 1930, kindly communicate with either Dr. I. S. Trostler, chairman, 25 East Washington street, Chicago, or to Dr. H. W. Grote, secretary, Bloomington, Illinois.

Papers will be given precedence in order of their application.

## COMMERCIAL HOUSE OVER RADIO RECOMMENDS PERIODIC HEALTH EXAMINATIONS

The Pepsodent Company is now advocating periodic health examinations from time to time in connection with their other broadcasts of Amos and Andy. This was undertaken at the suggestion of the officers of the Chicago Medical Society.

## THAT CHARITY IS PERNICIOUS WHICH TAKES FROM INDEPENDENCE ITS PROPER PRIDE AND FROM MENDICITY ITS PROPER SHAME

In his inaugural address before the Chicago Medical Society June, 1929, Dr. Charles B. Reed says:

"The practice of charity is one of the most ancient and glorious traditions of the medical profession, and only recently the Chicago Medical Society reaffirmed and published in its official transactions the ethical ideal that it is ready and willing at all times to serve the citizens of Cook

County irrespective of their economic status. The profession feels, however, that only too frequently its desire to serve the public is misunderstood or taken advantage of by the unworthy. *That charity is pernicious which takes from independence its proper pride and from mendicity its proper shame.* The abuse of charity leads for the physician to pauperization of the body and for the patient to the even more serious pauperization of the soul. In both cases civic pride is abolished by the personal degradation. The abuse of charity arouses the indignation of the physician because every such case prevents the extension of legitimate aid to a worthy object. This state of affairs is liable to continue, however, until society learns that the successful distribution of medical charity is a specialization which can only be accomplished through the exercise of the principle that MEDICAL MATTERS MUST BE MANAGED BY MEDICAL MEN."

## RUSSIA PROPOSES THE ABOLITION OF PRIVATE MEDICAL PRACTICE—RUSS DOCTORS GO COMMUNIST—KULAKS SUFFER—PHYSICIANS ORDERED TO TREAT WORKERS FIRST, THEN RICH CLASSES

Carroll Binder in the *Chicago Daily News*, February 2, 1930, says:

The class principle will be introduced into soviet medicine under instructions of the new health commissar, M. Vladimirsky. Henceforth soviet medicine must be mainly directed toward the service of the proletariat, he has told the Moscow medical congress.

In capitalistic nations only are the wealthy classes served by medicine, while the workers are treated by barbers and witches, according to the commissar. Under communism the favoritism reverses.

### NEPMEN MUST PAY MORE

Vladimirsky ordered the public health service to change the policy in the dental clinics and state health resorts, where in the normally overcrowded hospitals and clinics after all the proletarians are accommodated the nepmen, or small traders, and the kulaks are admissible at considerably higher prices, but not otherwise.

Simultaneously M. Popox, chief of the Moscow health department, has proposed the abolition of private medical practice. Physicians connected with state institutions already are forbidden to accept private patients so that the medical service available to numerous disfranchised persons is severely limited.

### LAND CONFISCATION PUSHED

An important decree issued yesterday legalizes the already widely prevalent practice of confiscating the property of the kulaks, as described in early dispatches.

Newspapers still report resistance on the part of some kulaks, but the number of acts of violence and punitive executions reported are fewer.

## Correspondence

### THERE IS NO INTERNATIONAL UNIFORMITY IN COLLECTING MORTALITY STATISTICS. THEREFORE, THE DEATH RATE OF DIFFERENT COUNTRIES CANNOT BE COMPARED.

Chicago, February 15, 1930.

*To the Editor:* The advocates of the Sheppard-Towner bill and other bemoaners of the fate of childbearing women in this country point with great authority to the fact that the United States has a higher maternal death rate than nearly every other country in the world. This "fact," which is based upon statistics and is therefore considered unequivocal, is by no means limited to lay magazines and newspapers, where well-meaning but misinformed reformers write heart-rending tales. Unfortunately the "fact" is also found in medical literature.

Wherein lies the fallacy? Simply in the realization that there is no international uniformity in collecting mortality statistics. Therefore, the death rates of different countries cannot be compared. Those who are obsessed with the idea that the United States is seventeenth on the list of maternal deaths, point out Russia, Italy and England as having low maternal death rates. The truth is, however, that since 1915 no trustworthy statistics have been published about Russia. Regarding Italy, there is no available information as to how their statistics are collected and England cannot be compared with our coun-

try for the following reason. The United States Census Bureau makes no distinction among women who die in the "puerperal state" by which is meant a death during pregnancy, confinement or period of nursing or a death which occurs within one month after the cessation of any of these three functions which can be connected with the term "puerperal death." The English, on the other hand, make several distinctions and therefore have a different classification which does not permit comparison with our statistics.

Because it has been impossible to compare the death rates of different countries, at the meeting of the American Medical Association held in Atlantic City last May, the Health Section of the League of Nations considered it important enough to call attention to this matter by posting a chart which bore the caption "International Incomparability of Mortality Statistics." In 1921 the Committee on Maternal and Infant Welfare of the Massachusetts Medical Society issued the following statement: "The undersigned regret the readiness with which medical writers all over the country have been willing to concede inferiority in obstetrics in the United States merely because of foreign statistics gathered under unknown conditions."

The truth is that good and bad work in obstetrics is done in every country; but the mortality rates for mothers and infants are certainly no greater in this country than they are in any other country. What we need here as elsewhere are more lying-in hospitals; for through them the number of maternal deaths will be considerably diminished. From my own observations abroad I have no hesitancy in saying that a pregnant woman is safer in a good maternity hospital in this country than she is anywhere in the world.

J. P. GREENHILL, M. D.

## THE UNITED STATES HAS NOT A HIGHER MATERNAL DEATH RATE THAN THE OTHER CIVILIZED NATIONS

### IF WE FOLLOW THE ENGLISH SYSTEM OF TABULATING, OUR STATISTICS WOULD TELL A DIFFERENT STORY

Chicago, February 15, 1930.

*To the Editor:* I was more than gratified to see your editorials on maternal mortality statistics. Such statements should be printed in every medical journal in the United States.

In the December, 1925, issue of the *Mothers' Aid Message* I wrote the enclosed editorial. It may interest you also to note that in the September, 1929, issue of the *American Journal of Public Health,* M. Nicoll, Jr., Commissioner of Health, State of New York, said the following:

"As good Americans, we claim and frequently exercise the inalienable right to criticize and condemn our own shortcomings as a nation, and in this spirit most of us at one time or another in our moments of oratorical inspiration have called upon our audiences to witness the disgraceful neglect of expectant mothers prevailing throughout this country, resulting in a higher maternal death rates than in most of the civilized nations. This fact would seem to be proved statistically, and yet before permitting ourselves to indulge in too violent self-condemnation, let us be certain that the figures of other countries are as accurate as ours, and based on identical methods of allocating causes of deaths. Furthermore. those countries that show the lowest maternal death rate are very small in area compared with the United States, and contain a much more homogeneous population than that with which we have to deal. No nation, except ours, is called upon to face such a racial variation in fitness for motherhood. It can hardly be supposed that maternity work in certain states in the northwest is accountable for the low maternal mortality as compared with that of most other states; it is rather the physical development and habits of people of Scandinavian blood, among whom in their mother country the maternal death rate is exceedingly low, and, incidentally, lower than among the immigrants of that race and their descendants in this country."

In the discussion on maternal mortality at the meeting of the American Medical Association in Portland, July 12, 1929, C. E. Mongan said the following:

"There is a tendency in the United States to compare our statistics with those of European countries to the detriment of the United States. Dr. Thomas J. Duffield of New Jersesy wrote in 1923 a graduation thesis for the Massachusetts Institute of Technology in which he shows how divergent the methods are in collecting vital statistics in Europe. Switzerland seems to be the

one country which has a fair and accurate method. English statistics are often quoted. Newsholme, in his vital statistics, shows how 1,086 puerperal deaths are eliminated. By his process the death rate in England in one year was reduced from 5.46 to 4.12 per thousand births. The United States Census Bureau will not allow physicians in the United States to follow the English plan. Offhand I would say that it would reduce our number of deaths by about 4,000. Under these circumstances would it not be better to compare the statistics of one state with those of another rather than the whole of the United States with those from foreign countries? If we followed English methods our statistics would tell a different story. There is no other country which has to contend with such climatic, social and economic conditions as is the case in the United States. In the South the negro woman has a high mortality rate in the puerperal state."

Very sincerely,
J. P. GREENHILL.

## THERE ARE NO COMPARABLE RECORDS SHOWING THAT THE UNITED STATES OCCUPIES FIFTEENTH PLACE OR ANY OTHER POSITION IN MATERNAL MORTALITY STATISTICS

Chicago, Ill., February 4, 1930.

*To the Editor:* I have your letter of January 16, 1930, relative to statistics of maternal mortality and morbidity. I may state that I have no reports that are comprehensive enough or that are based on comparable records showing that the United States occupies fifteenth place or any other position in maternal mortality statistics. I know of no statistics on which such a statement can be based. For this reason I am one of those who has not been decrying our own methods and results.

In my own practice and that of my colleagues I do not see maternal mortality and very little morbidity. Infection and toxemia simply do not occur.

I agree with you that the statistics so often referred to are of little or no value for the reasons you say, and I am glad you are interested in this matter.

CAREY CULBERTSON, M. D.

## AUTOGENOUS VACCINES

By means of a questionnaire, Robert A. Keilty, Washington, D. C. (*Journal A. M. A.*, Jan. 11, 1930), ascertained that vaccine therapy is apparently being used only by a small percentage of the profession. Good results from vaccines, as shown by 65 per cent of cases in group A of the series, may be obtained by the ordinary methods of preparation. Results are improved and increased when vaccines are made from carefully selected floras and the doses fixed according to the predominance of organisms, irrespective of the number in the final suspension. It is not necessary to count the bacteria by any method in a vaccine preparation. The dosage should be given and timed according to the local and general reactions produced. As a rule, one may start with 0.1 cc., increase the amount every other day from 0.1 to 0.2 cc. until the maximum, 1 to 1.5 cc., is given. The dose should then be reduced just short of reaction and continued at five-day intervals. From fifteen to twenty doses should be given over a period of from three to six weeks. A follow-up series should be repeated in from two to six months. Autogenous vaccines are not cure-alls, but have a definite field of usefulness. If they are reserved for the selected cases, in which they may be expected to help, they will show an improvement in well over half of the cases, some brilliant complete cures and some flat failures.

## THROMBOANGIITIS OBLITERANS

In the Medical Journal and Record for April 3, 1929, A. M. Rechtman says:

The pathology was described as an inflammatory lesion of the arteries and veins with the presence of giant cells and cellular thrombosis in the acute lesions. The first symptom complained of is intermittent claudication. It appears early in the feet or in the calf of the leg as a pain or cramp caused by exercise, such as walking, and is relieved by rest.

## DAMNED IF YOU DO AND DAMNED IF YOU DON'T

GETTING OUT THE JOURNAL

Getting out a bulletin is no picnic.

If we print jokes, people say that we are silly.

If we don't print them, they say we are too serious.

If we print original matter, they say we lack variety.

If we publish things from other papers, we are too lazy to write.

If we stay on the job, we ought to be out hustling news.

If we are hustling news, we are not attending to business in our own department.

If we don't print all contributions, we don't show the proper appreciation.

If we do print all contributions, the paper is filled with junk.

Like as not some one will say we swiped this from an exchange. So we did.

## Original Articles

# NATURE AND GENESIS OF ADVENTITIOUS FOLDS AND ADHESIONS OF THE PERITONEUM*

ARTHUR E. HERTZLER, M.D.,
HALSTEAD, KANSAS

*The Problems Involved.* There is probably no subject in surgery regarding which so much uncertainty exists as about adhesions. Anything not in harmony with the textbook pictures in anatomy is too commonly regarded as abnormal. This leads to useless tinkering with the abdominal architecture. But, what is more important, it misleads the operator in his search for the cause of the patient's symptoms. A fold of peritoneum is seized upon as evidence of past disease or of chronic inflammation of this or that organ and in correcting the supposed lesion the search for the real disease is abandoned.

One example will suffice. An unusual fold is found about the appendix which the operator does not understand. He thinks of a past attack of appendicitis. If also the appendix is hyperemic he is quite apt to think of a recurring appendicitis. The hyperemia may be due to dilatation of the subperitoneal vessels only, a veritable varicosity, without any involvement of the deeper vessels and without the concomitant swelling due to edema. What this should spell to the operator is trouble, not in the appendix, but in some neighboring organ, the gall bladder, the stomach, the pelvic organs, an acute pancreatitis. intestinal obstruction, or what not. This fallacious reasoning, if reasoning it can be called, has led to the yet commonly accepted view of chronic appendicitis which is, of course, not a disease entity, but like religion, is a state of mind quite incapable of clinical demonstration or proof in the laboratory. Both being incapable of proof are, in consequence, incapable of disproof.

The first clue to a correct diagnosis in such a picture is the proper interpretation of the gross anatomic findings. Two causes lead to confusion. The development of the gut tract is imperfectly understood. This leads to a misinterpretation of folds that are unusual but perfectly normal when viewed from the standpoint of development. Second, adhesions are regarded as evidence of former acute infections, especially suppurative lesions. The first fallacy can be corrected only by a first-hand knowledge of the various stages of fetal development. The second fallacy becomes clear when we understand that adhesions which attend acute infective processes are temporary in nature and once the inflammation subsides. the purpose which brought them into being no longer exists, they vanish, leaving little or no trace. Permanent adhesions result generally from mild infections or aseptic trauma generally due to the efforts of some well-meaning but misguided operator. In this connection it must be remembered that in its earliest stages inflammation parallels the processes of wound healing as is evidenced by histo-chemical study. It is only those inflammations which do not go beyond this stage that are followed by permanent adhesions.

A misinterpretation of the importance of adhesions leads to a presumption of their existence when the patient is not relieved from his ills by operation. Adhesions in themselves, as a matter of fact, produce no symptoms. It is only when they disturb the function of an organ that they become of clinical importance. If, instead of ascribing the persistence of symptoms to adhesions. a renewed effort were made to extend the diagnosis, but little complaint would be directed to the adhesions.

In the study of adhesions, as in the investigation of other practical subjects, it is a mistake to separate the laboratory from the clinical study. If an unusual fold is encountered a review of the clinical history is in order to determine if such a structure in any way could account for the symptoms. If this point is kept in mind the presence of adhesions will not cause a fright. One needs only to remember, for instance, the very extensive adhesions commonly seen in peritoneal tuberculosis to understand how abundant they may be with little interference with the functioning of the intestinal tract. The mere discovery of an adhesion spells nothing so far as symptomatology is concerned and, of course, the mistaking of an unusual fold for an adhesion means less than nothing because it is wholly misleading.

It is my purpose, in the first place, to review

*Read before Section on Surgery at meeting of Illinois State Medical Society, at Peoria, May 21, 1929.

briefly the embryological development of the peritoneum and to compare the unusual features in development with the topographic anatomy of the adult, and in the second place to show the fundamental factors which determine whether an adhesion will be temporary or permanent. I shall likewise indicate the means we have of distinguishing between permanent adhesions and adventitious folds as we see them at the operating table. In the discussion of this feature I shall be obliged to confess that my information is fragmentary and indefinite, compelling my presentation to be tentative and hesitating. My statements can but indicate the lines along which, in my judgment, our studies should proceed.

*The Normal Anatomy of the Abdominal Viscera.* Nowhere is a working knowledge of the variations in anatomic structure so important as

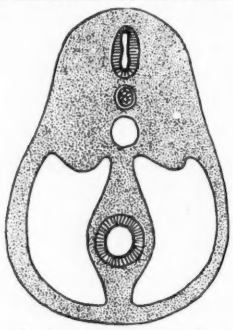

Fig. 1. Schematic drawing representing the mesentery, and the primitive gut tract. (Minot.)

in the interpretation of unusual peritoneal folds. Such knowledge can be gained by the study of fetuses, with which most laboratories abound, by observation of the variations in anatomic structure at autopsies and by noting the unusual during the performance of abdominal operations.

*Embryology of the Gut Tract.* Before about the third or fourth week of fetal life the future gut tract is represented by a cellular mass which extends from the region of the aorta to the anterior abdominal wall dividing the future abdominal cavity into two compartments (Fig. 1). The primitive gut tract develops in this mass. The portion of the dividing septum anterior to the gut tract and below the stomach disappears at about this time. As the gut tract develops it becomes too long for its space and coiling is necessary and continues until the adult stage is reached. It is this readjustment of the relation of the various segments of the gut tract to the available space that makes our problem.

At first a single loop develops (Fig. 2) in the lower limb of which a bud appears, the future

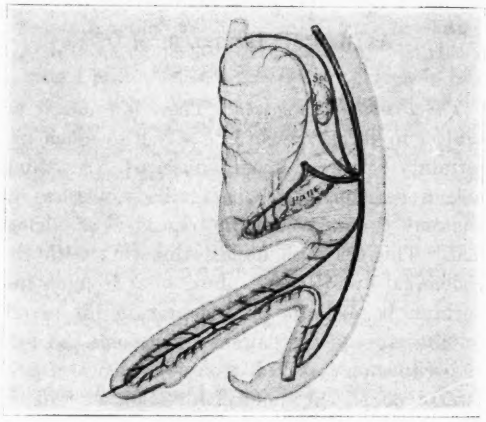

Fig. 2. The primitie digestive organs and their vessels. (Hertwig.)

cecum. This bud becomes a point of identification which enables us to follow the subsequent migrations of the big gut. The upper limb of the loop forms the small intestine. The future cecum comes to pass over the upper limb of the primitive loop in order to reach its final resting place in the right lower quadrant of the abdomen (Fig. 3). The motivating factor seems

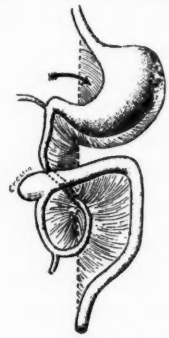

Fig. 3. This is the common presentation of the textbooks on embryology. The cecum invariably crosses the midline just below the pyloric end of the stomach.

to be the rapid development and rigidity of the future big gut forcing the cecal bud to pass over the upper limb of the primitive loop.

It is in the migrations of the cecal bud that the pictures in the embryology books lead us astray. They indicate that the cecum describes a more or less wide circle and flops at once into

its permanent resting place. It is not so. The future cecum in passing from left to right first becomes attached to the posterior abdominal wall

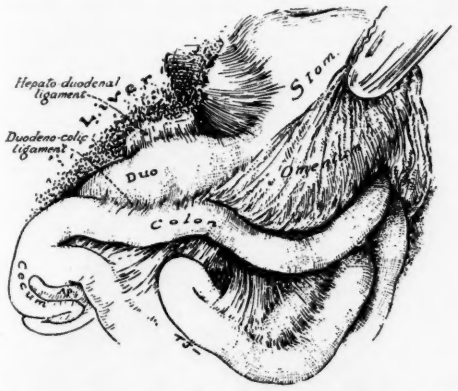


Fig. 4. The colon in its migration receives its first attachment over the duodenum close to the pylorus. The great omentum becomes first attached to the colon at this point. In some instances the attachment is closer to the ileocecal junction than shown in this figure.

just beneath or a little to the right of the first part of the duodenum, the attachment becoming the future duodenocolic ligament (Fig. 4).

The gut tract in this stage does not have the individual coats which ultimately form the gut

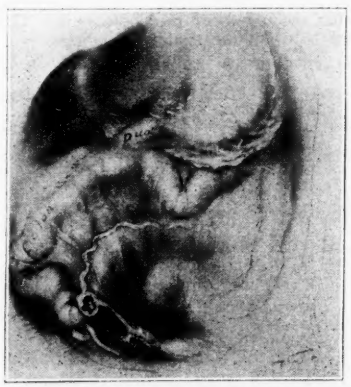

Fig. 5. In rare instances there is an extensive adhesion of the ascending colon to the posterior parietal wall. This wide fusion may persist throughout life. Compare Fig. 10.

wall. The walls are plastic protoplasmic walls admitting of the formation of attachments much more readily than does the adult gut. Because of this plasticity the early gut tract is quite commonly submerged in the posterior parietal wall and only later acquires a mesentery (Fig. 5). This late acquisition of a mesentery makes possible the great variety of folds so commonly mistaken for adhesions and accounts for the variations in position of the cecum and appendix. It is this normal variation in normal intestinal topography which has caused the great furor operatoria among a host of operators.

The first cause of confusion is the early attachment of the great omentum, either directly to the cecal bud or near it, at the same time that

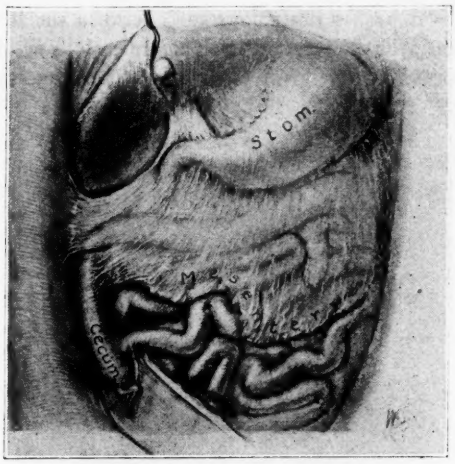


Fig. 6. The early fusion of the great omentum to the colon may result in this structure being carried to the right parietal wall and may even become attached to it. The "double-barreled colon" may result from this condition.

it becomes attached to the first part of the duodenum. As the cecum develops the omental fold is conveyed with it toward the lateral abdominal wall where it even may become attached producing the ligament of Haller (Figs. 6 and 7), a

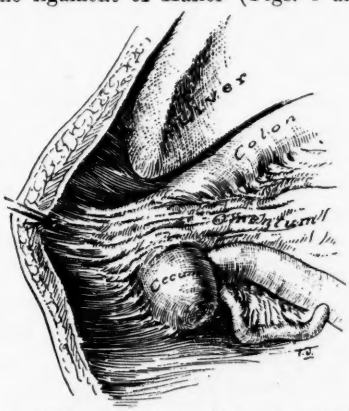


Fig. 7. The omental attachment in the foregoing may be represented by a small band of omentum and then is easily mistaken for an adhesion.

structure very commonly regarded as the product of a past inflammation. In this early stage the adventitious folds are numerous and if they all persisted to the adult state many a surgeon would be given a fright which he now escapes. Time permits only of the examination of the genesis of the more common folds which interest and confuse the operator.

Because of the comparatively large size of the liver in the embryo, as the gall bladder develops it pushes itself downward between the liver and pylorus and the future big gut. It is at this point that the great omentum first becomes at-

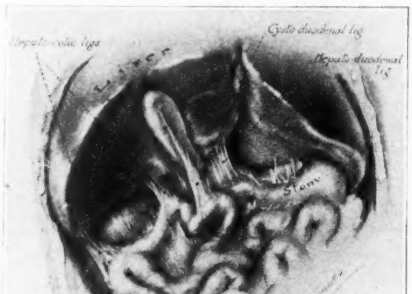


Fig. 8. The various ligaments extending from the liver to the hollow viscera are well marked. The hepatoduodenal ligament is shown extending over the duodenum to the colon. (Seven-month fetus.) Such ligaments are more pronounced in the fetus than in the adult.

tached to the future transverse colon as above noted. It is not surprising, therefore. that the cystic duct regularly, and the gall bladder frequently, has a meson. Therefore, to regard every fold extending from the gall bladder to the duodenum and colon as an adhesion is to court error. The presumptive evidence always indicates a normal meson. There are many points of attachment of the liver to the gut tract in the embryo not commonly observed in the adult. These persist oftener than many surgeons realize and have found a place in the nomenclature, namely the hepato-duodenal and the hepato-colic (Fig. 8). These may exist in a variety of forms and locations. Any peritoneal band extending from the colon and attached to the liver itself is almost sure to be a normal fold (Fig. 9.) The adult liver is little prone to form adhesions because its capsule lacks the subendothelial structure that favors the formation of adhesions between other peritoneal structures. To produce adhesion to the liver in the experimental laboratory

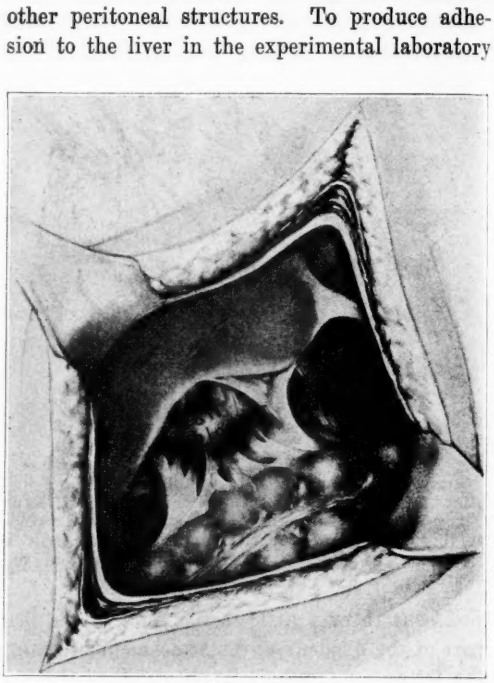

Fig. 9. Bands extend from the colon to the gall bladder and to the liver. Attachments to the liver proper are always the result of disease or operative trauma. In the case here represented there was a ball-valve stone which accounted for the cholecystitis. The clinical history bore out the anatomic findings.

it is necessary to destroy the fibrous capsule as well as the endothelial cell layer. It is not surprising, therefore, to find that adhesions about

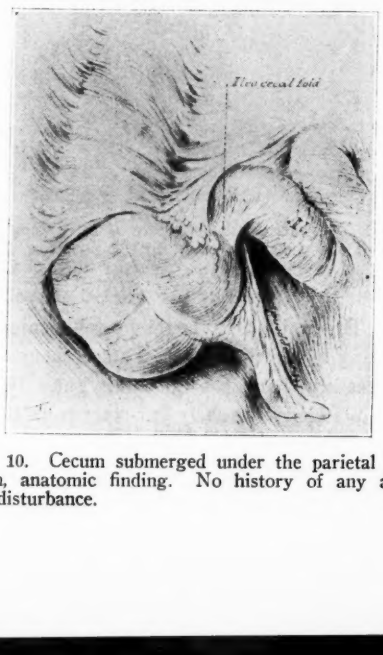


Fig. 10. Cecum submerged under the parietal peritoneum, anatomic finding. No history of any abdominal disturbance.

the liver itself are most commonly the result of operative trauma.

It is the cecal region, however, that shows the greatest normal variations. The location of the

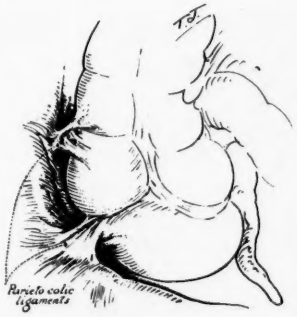


Fig. 11. Parieto-colic ligaments, a common finding at the operative table, are of no anatomic or clinical significance.

cecum at a given period of the fetal development is the most inconstant thing in anatomy. It has been noted that at the early stage the colon is submerged and only later acquires the degree of mobility common to the adult. In securing this mobility it acquires various folds which extend from it to the parietal wall. Sometimes the emergence is incomplete and the colon remains submerged by what appears to be an adventitious band (Fig. 10) which is little different from the later attachment of the great omentum al-

Fig. 12. A prominent genitoenteric fold from the ovary to the terminal portion of the ileum. This represents the ilioovarian ligament of Durand. The ligament becomes prominent only when the terminal ileum is lifted out of the pelvic. Normal specimen from a new-born child.

ready referred to as Haller's ligament. Lesser attachments are called parieto-colic ligaments (Fig. 11). The sight of such a fold is very apt to produce pruritus digiti on the part of even the more conservative surgeon.

*Gross Anatomy of the Gut Tract.* Having glanced at the development of the gut tract with the resultant folds it becomes necessary to study the relations of these folds to the viscera in the adult.

It must be insisted on that the folds be observed as the viscera are in their normal position. If they are pulled hither and yon a limitless number of folds can be produced which in fact do not exist. It is worth while to review some of the normal folds which most often lead to confusion.

It is the ileum that has been the site of such artificial folds that have led to the most ludi-

Fig. 13. Same as the preceding, showing the necessity of pronounced traction on the ileum before the band becomes prominent.

crous conclusions. This is due wholly to its mobility. Coming as it usually does, from the depths of the pelvis to reach the cecum it naturally has a peritoneal covering most convenient for every-day wear. When it is lifted from its normal habitat this covering naturally is put on a stretch, the most commonly producing the genito-enteric band, (Fig. 12) a structure nonexistent when the gut lies where it normally belongs. The same applies to the ilio-ovarian ligament (Fig. 13). The failure to recognize this evident anatomic fact has made possible the amazing theories of Lane.

The relation of the appendix to the cecum has given rise to much confusion. When the appendix is truly retroperitoneal or frankly within the wall of the gut the condition is universally recognized as being of congenital origin, but when

the extraperitoneal situation is partial (Fig. 14) it is commonly regarded as the result of inflammation. Of course, an appendix so situated may become inflamed but this is no evidence that the inflammation preceded its peculiar peritoneal relationship. The proof of this can be adduced only by the location of the membranous limitans in the slide of a cross section. The important point is that such a relationship is not proof that the patient has had an appendicitis and the discovery of it does not end the surgeon's search.

The ileoparietal fold extending from the ileum to the lateral wall, forming a pocket for the cecum, is not an unusual fold (Fig. 15). The external and internal parieto-colic folds when the cecum is retracted upwards may appear as abnormal bands (Fig. 16) but when the cecum is allowed to return to its normal habitat these disappear. Sometimes more or less of the colon is covered by a peritoneum (Fig. 10) which finds its counterpart not infrequently in early fetal life. Whether or not they cause disturbance is impossible to say. Good surgeons have held them guilty and report good results from their removal. No after results have been reported. Certain it is that they are often present without producing any symptoms at all. One often finds them in bodies when no symptoms below the diaphragm were complained of during life. It is equally true that the cecum has been divested of its peritoneal coat without cause and without result. These few examples suffice to illustrate the importance of an acquaintance with the unusual folds of the peritoneum.

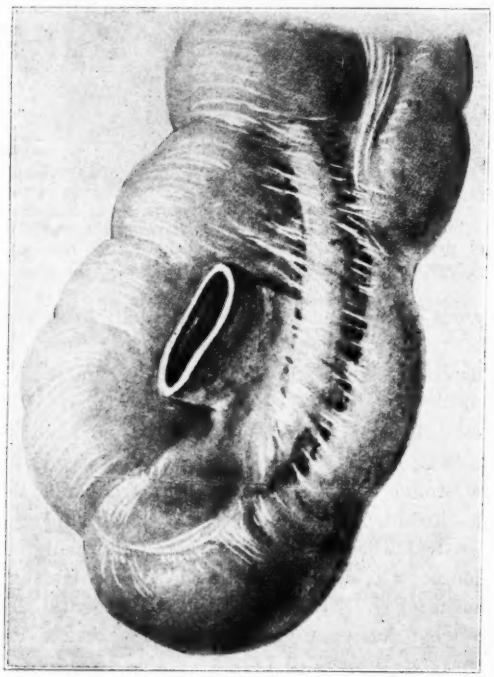

Fig. 14. Figure taken from a paper recently published. The condition is probably congenital. The question could be decided only by a microscopic study. The pathologist's report that the appendix was normal is obviously correct. In some of these cases the bands extending from the appendix to the cecal wall contain muscle fibres, proving that they are of congenital origin.

Fig. 15. Ileoparietal fold commonly mistaken as the product of adhesion. This, together with the genito-enteric fold, is commonly the cause of a kink—if the ileum is lifted high enough.

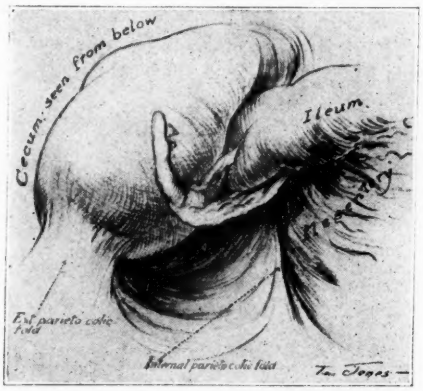


Fig. 16. Internal and external parietocolic folds made prominent only by traction on the cecum giving the erroneous impression of a fossa behind the cecum.

It is impossible to over-emphasize the very

obvious fact that bands and ligaments which are produced when an organ is dislocated from its bed are always artificial. The cecum is particularly liable to give place to such structures because of its mobility. Traction in one direction produces a "band" on the one side, traction in the reverse direction produces a like "band" on the other side. When it is dropped into place all bands disappear. Nothing can be more obvious; no fact is more generally ignored.

Before a band or fold in question can be convicted of producing a constriction it must first be established that it does constrict. Such evidence is found in hypertrophy of the proximal thickening of the gut wall and a dilatation of the gut lumen. M. L. Harris let out a loud protest along this line years ago but it has not received the attention it deserved. It is argued that a band may cause trouble by limiting the movement of an organ when constriction sufficient to produce hypertrophy and dilatation does not exist. That is pure hypothesis. That such adhesions may cause trouble in rare instances may be admitted but it is necessary to prove the relationship of such bands to the symptoms complained of by a long observation of the after-course. Of course, acute obstructions are sometimes produced such bands but in these cases the relation is obvious.

*The Formation of Adhesions.* Having looked briefly at the various folds of the peritoneum which may simulate adhesions, it now remains to study the fundamental factors in the formation of adhesions. It is quite possible by the study of an adhesion to tell what the nature of the process was that produced it. This is of the greatest importance in practical surgery for one is often compelled to decide which adhesions were produced by disease and which by the operator who did the preceding operation. As a prelude one may put it down as a clinical fact that when a patient comes complaining of "adhesions" one may safely conclude that the patient is a neurotic and did not require an operation in the first place and also that the doctors who first used the term "adhesion" within the hearing of the patient know nothing about adhesions and little about clinical diagnosis.

Adhesions are divisible into two groups; the permanent which remain throughout life, and the temporary which disappear after their purpose of limiting the extension of an infection has been accomplished.

It may be put down as an axiom that an infective process is accompanied by temporary adhesions which vanish after the infective process has run its course and on the contrary permanent adhesions are the result of aseptic trauma either mechanical or chemical.

To understand the two types of adhesions one must study the fundamental processes in wound healing. We can best do this by imitating in

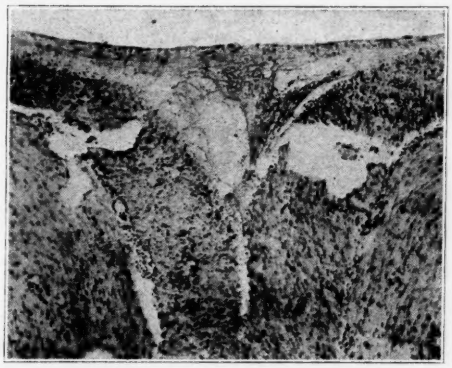

Fig. 17. Two intestinal coils have been united by a suture. The angle between the walls of the gut have been bridged by fibrin bundles extending from one gut surface to the other.

the experimental animal the procedures of the operating room. When two gut surfaces are united by Lembert sutures a serous exudate is thrown out within 10 to 30 minutes. This undergoes coagulation forming strands of fibrin extending from one gut surface to the other (Fig. 17). This is usually complete in two hours. These strands form the permanent union between the gut surfaces. They undergo chemical changes but are not renewed nor replaced nor do they vanish. These studies have been so fully confirmed by Baitsell and Wereschinski that I have no longer any hesitancy in presenting this as a most important fundamental fact in the interpretation of intra-abdominal adhesions.

The essential factor in the production of a permanent adhesion is that the exudate remains free from factors which prevent blood coagulation. The various digestive exudates and most infections do this. When the exudaate is so contaminated fibrillar fibrin cannot be formed and

a granular exudate results (Fig. 18) which is incapable of conversion into adult connective tissue and must be resorbed and replaced by connective tissue produced by fibroblasts. The generally accepted conception of wound healing is based on the study of infected material exclusively. If surfaces are kept in contact sufficiently long permanent adhesions will result even in in-

Fig. 18. The angle between the gut surfaces is filled by a granular fibrin the result of an infective process. The adhesion is temporary.

fected material but in the ordinary course of inflammatory lesions in the abdomen they do not meet these requirements and as soon as the infection is overcome by the natural defensive forces the phagocites remove the granular fibrin and the adhesions are released. However, if the process is such that infection is continuous and a secondary layer of exudate forms over the primary one the adhesion may become permanent. For instance, in a fecal fistula after drainage of an appendiceal abscess. The infection is kept up about the fistula and there gradually forms permanent fibrin or the granular exudate kept up by the continuous infection undergoes a fibrosis and therefore is permanent.

Those of us whose surgical experience goes back to the time when we saw our appendix cases only after an abscess had formed well know that the masses of adhesions which walled off the abscess had all disappeared when the appendix was removed 3 or 6 months later.

There is no more striking example of the capacity of adaptation in pathology than the study of just this process. Some twenty-five years ago (Trans. Western Surg. Ass'n. 1904) I studied this process in animals by sewing a glass window into the abdominal wall so that the process could be observed from day to day. This method has been employed by more recent investigators, notably by Westman (Arch. f. Gynak. 1929, cxxxv, 515). By this means one can observe how at first the coils remain quiet but after the reaction has run its course peristalsis becomes more active as the exudate is resorbed until finally the previously adherent coils have liberated themselves.*

Thus by piecing together the knowledge gained from histological study, clinical experience and direct observation we may know positively the life history of the temporary adhesion and why it is so.

*Differentiation Between Unusual Folds and Adhesions.* First, by a full acquaintance with the developmental processes so that we may

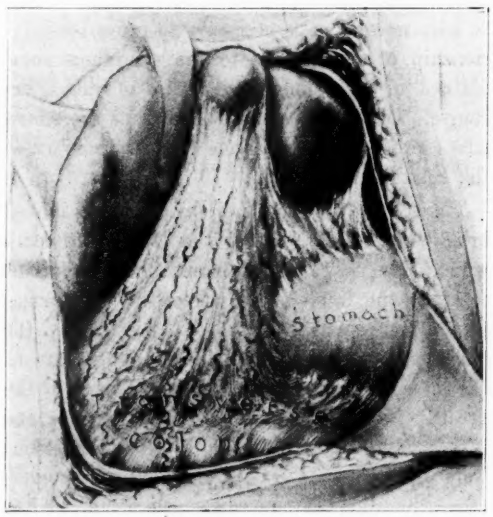


Fig. 19. The cysto-duodeno-colic ligament is made hyperemic and edematous by an inflamed gall bladder. There are no adhesions.

know where it is possible for such folds to form. In the absence of a previous operation it is always likely that an unusual fold is not an adhesion. To declare it the result of a pathological

*It is necessary to protect the window by a silver filagree; otherwise the window is soon soiled by contact with the intestinal coils so that further observation is obscured.

process. positive evidence must be adduced. Conversely, bands situated where anatomic folds cannot form must be due to some past disease process. Whether a fold is developmental or the product of past inflammation may be decided by the position of the leading vessel. For instance, if an unusually placed meson carries the chief vessel it is a normal fold and not the result of a past inflammation. Vessels in adhesions are usually small, almost capillary in size.

When adhesions complicate normal anatomical folds the problem becomes more difficult. The gall bladder region affords the most complex examples (Fig. 19). If the gall bladder cannot be elevated from the duodenum or if the peritoneal attachment to the gall bladder extends from the sides of the gall bladder to the liver even to the abdominal wall there has been some irritative process at work. The adhesion of the great omentum to the gall bladder is always the result of disease or trauma. In the ileocecal region if the appendix is attached to the cecum but the appendiceal artery shows the presence of a meson elsewhere a past disease may be presumed. In Fig. 20—4, the appendix receives its blood supply from various sources. There is no appendiceal artery. This we may therefore recognize as a developmental anomaly. If in 3, Fig. 20, small vessels extended from the cecum to the appendix and we discovered the appendiceal artery in the position in the figure we would know the small vessels were the result of some past disease.

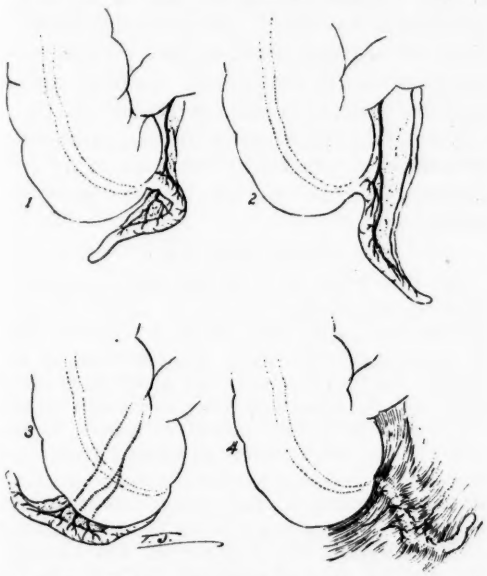


Fig. 20. Effect of the varying positions of the appendix on the location of the appendiceal artery (see 3) is commonly mistaken for an adhesion as is 4 which is obviously congenital because there was no appendiceal artery.

The appendiceal artery may not be in its usual position (Fig. 20). The meso appendix is without a vessel and one may erroneously conclude that none exists. The appendiceal vessel lies higher up and is covered by the cecum and may be overlooked in the course of the operation. It is of great practical importance to locate definitely the appendiceal artery lest it be overlooked and late hemorrhage occur.

Even when an unusual fold is proved to be an adhesion one still must decide whether or not it causes trouble or whether it is but a historical landmark. If not capable of harm it is best to leave it alone for if severed it may reform in a less favorable position. Practical experience shows that the vast majority of adhesions are of interest only because they tell us something of the past history. Often in removing a gall bladder, for instance, which is surrounded by adhesions the product of inflammation or previous operative trauma, one can remove the gall bladder by separating only a small part of the adhesions. Even in the familiar adhesions about the tubes and ovaries to which are ascribed the complaints of the patient, far too often when these are remedied the patient still complains. Other factors may be active which should be taken into account before the adherent tubes are attacked. It is not the adhesion but the patient's present complaints that must be foremost in the surgeon's mind.

*Summary and Conclusions*

1. An understanding of the embryology of the gut tract is essential to the understanding of the adult anatomy.

2. An endless study of anatomic variations as observed in the abdomens of those who had no complaints referable to this region is essential to an adequate comprehension of the extent of the anomalies of development.

3. Adhesions attending suppurative diseases are temporary.

4. Permanent adhesions are the result of mild infections or trauma.

5. Adhesions when encountered may be of

but historical importance and their separation is not warranted unless it is demonstrated that they bear a direct relation to the symptoms now complained of.

## RADIOULNAR SYNOSTOSIS, WITH REPORT OF A CASE*

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CHICAGO

An unusual congenital deformity which has been termed "radioulnar synostosis" presents interesting features which warrant a detailed study of this peculiar anomaly and a report of a case.

This condition has also been called "congenital pronation" because of the inability of the subject to supinate the hand; that is, he or she cannot turn the palm upward. In other words, the wrist is in fixed pronation.

With advent of the x-ray in the study of the skeletal structures of the body, the presence of this lesion has been discovered in a small number of instances, but it was known in the preroentgen era through post mortem studies. Upyards of 100 cases of this lesion are recorded in literature. Kienbock[1], in 1910 reported several cases, Baisch[2], in 1912 described four cases and refers to 38 others, including those of Kienbock; Sontag[3], Luden[4], Grashey[5] and Köhler[6], are among those who have written on this rare lesion. The most illuminative presentation in English on radioulnar synostosis is the extended article by Davenport, Taylor and Nelson[7], who jointly made a most thorough excursion into various fields in the study from many angles of 15 cases which they found to have this lesion.

Radioulnar synostosis is a congenital fault which consists of the fusion of the upper portions of the radius and ulna in a more or less degree of pronation due to which supination is impossible. The amount of fusion of the bones varies from one to six centimeters in length in the reported cases. In a litle more than 50 per cent. of the studied cases the condition was found to be bilateral and occurred far more often in males than in females. In several of the cases it was found to have occurred in successive generations of a family line but a careful analysis of successive issues in other families in which the lesion occurred, failed to show such a familial sequence. In certain strains this peculiar synostosis appears to be of a dominant mendelian character. The evidence seems to show that while its appearance does not exactly follow the mendalian formula, it is possible that some complex variation of this theory may be involved. In one family inheritance investigated by Davenport, Taylor and Nelson, they found that there was no regular pattern of occurrence of the lesion under consideration. One female appears to have been affected in four generations and one case of unilateral involvement was noted. The extensive involvement and sequence found in this one family is not duplicated in the pedigree charts of any of the other families studied by Davenport et al., who found that the usual occurrence of synostotic individuals in successive generations is far less frequent than is recorded in this particular family.

### CASE REPORT

The case which came to my notice is that of A. B. C., a graduate in medicine. He is 28 years of age, white, and weighs about 165 pounds. He is of robust or stocky build. His appearance is not unusual although one may note a seemingly short neck, and the upper and lower extremities appear somewhat shorter than normal in relation to the length of the body. He is in splendid health and there is no history of a major injury to either of the upper extremities. Just prior to entering school at 5 years of age, a minor injury to the right wrist occurred when it was first noticed that he could not turn his hand in supination. There were no untoward events in connection with prenatal or obstetrical periods, so far as can be ascertained. No similar occurrence is known of in the two preceding generations. He is considerably handicapped in that he is unable to pronate either of the forearms. The left forearm is fixed in a position midway between pronation and supination, that is, about 90 degrees, while the right forearm is fixed in nearly complete pronation, lacking about 15 degrees. This enables him to use the left hand to a much greater degree than the right. In writing he has relatively little difficulty in holding the pen and writes a legible hand. In eating he has difficulty in handling spoon and fork and holds these as does an infant, that is, sideways with the elbow held high. In receiving coins, etc., he cups the left hand and can thus retain the object being handled with very little difficulty. Flexion and extension of the forearms are not restricted or interferred with. Both

*Read before Section on Radiology, Illinois State Medical Society, May 23, 1929, Peoria.

wrists, the hands and the fingers all function in a normal manner.

An x-ray investigation of the case reveals a bony fusion of the radii with the ulna. The synostosis amounts to about a centimeter on the left side and 6 centimeters on the right side. The bone texture is normal in every way. There is also an asymmetry at the wrists, the right one showing a degree of posterior luxation of the ulna with a prominent styloid process. The left wrist appears normal. No bone or joint variations were found in the neck, upper spine, lower thighs, knees or upper legs.

The type revealed in this case is the deformity found in the typical cases described by most of the authors who have reported this lesion in detail. Variants in the lesion are many. In many cases the forearms present different degrees of the pronation deformity right and left as regards the fixed position of the hands and lower forearms. In certain cases the integrity of the elbow joint is not altered, the articulating surfaces being smooth and regular. In a considerable number of cases there was an absence of the head of the radius, this structure being represented by merely a rounded upper end instead of the flattened knob form as seen in the roentgenogram of the normal. This has been called the "headless type." That it is an atavistic throwback is a possibility, as a somewhat similar development is found in the radius and ulna of the deer, in which these two bones are separated in the young animal but they normally become fused in the matured animals. One may also cite a similarity in the fusion of the several bones that form the human skull with fusion and resulting obliteration of interoseous spaces is a normal sequence in the aged. In none of the many cases reported have I found any reference to any accompanying synarthrosis of the nearby elbow joint.

A study of the two bones involved in this peculiar bony union from the phylogenetic standpoint reveals certain aspects which may have some bearing on its formation. It has been shown that the fins of fishes are forerunners of the body appendages in man, namely, the hands and feet. In the amphibia the number of bones distal to the humerus is reduced to two, one of which the radius, lies anterior supporting the carpus, and the other, the ulna, is posterior, containing the elbow process or the olecranon. It will be noted that when a child crawls prior to learning to walk it acts as a quadruped and in so doing the radius is crossed in front of the ulna but when it attains the erect posture, the plane of the lower ends of the radius and ulna turn outward 90 degrees, that is, they supinate and thus assume the sagittal plane. In the ungulates, such as the horse, deer, etc., the ulna is rudimentary and, as has been noted in a previous paragraph, in the older deer the radius and ulna regularly undergo a fusion of their proximal portions. In bats, also, the radius and ulna are fused in like manner.

Embryological considerations of the subject under consideration reveals that in the earlier weeks of development of the human embryo, the arms grow outward almost perpendicular to the long axis of the torso and thus lie at right angles to it. They soon become flexed and turn medially so that the palmar aspects of the hand lie applied to the front of the chest. Thus the opposite ends of the ulna and radius become reversed in position. In this position an x-ray projection of the normal bones would present an appearance of the fusion of their upper ends due to overlapping, while the distal ends would be seen to be separated as they are not superimposed. Thus there is a relatively close approximation of the upper ends of the radius and ulna at this stage and it is conceivable that certain postural pressures would cause an increased contact or squeezing together of the opposing surfaces of the upper ends of the ulna and radius which might result in a mutation fault of development, the two bones becoming blended where the direct contact occurred. Another angle of the situation will be recognized in the fact that both of these bones arise from a single precartilagenous unit in which two centers later appear, one for each of the two bones of the forearm. Thus a synostotic state normally occurs in the early embryonic stages of growth. The event of an incomplete separation of these two centers may explain the occurrence of radioulnar synostosis. This failure of separation may or may not be an inherited trait; in some strains it appears definitely proven to have been inherited, but in other cases investigated it apparently is not a transmitted characteristic. In the case being reported the patient knows of not one other such occurrence in his family antecedents. Being a physician, he has made a thorough study of the situation and thus we may rely on

this point of there being no other involvements in his line.

It has been observed that in certain families in which synostotic individuals occurred in several succeeding generations they were all of short stature, while the isolated occurrences appeared in individuals who were not short or of the pudgy habitus.

In several instances of radioulnar synostosis, multiple cartilagenous exostoses were present which condition seems to be related to the lesion under consideration but the connection is not closely defined. The occurrence of other bony defects such as club feet, club hands, absence of certain fingers and toes, fusion of fingers, etc., has also been noted in a number of the reported cases of radioulnar synostosis. Having these concomitant conditions in mind one may speak of the lesion under consideration as in the classification of a dyschondroplasia. The common idea of this lesion appears to be that it is an inherited condition but in the case the subject of this report, no other similar instance in the antecedents has been discovered as has previously been stated. In the group of cases in which heredity plays a part, the inheritance is always in the male line, and it is bilateral in about 50 per cent. of the reported cases.

Note is made of the relatively greater occurrence in families in which there are consanguineous unions. Davenport et al., say "it may be remarked that a large proportion of the families we have studied at first hand are Jewish and thus belong to a race in which consanguineous marriage is relatively common. Thus of our 13 families, 9 are Jewish, 1 German, 1 French Irish, 1 Irish and 1 English."

The conclusions of Davenport et al. are as follows:

"On the whole, the evidence seems to favor the conclusion that there is some truth in all of the hypotheses and that radioulnar synostosis is a trait that, in different biotypes, depends on one, two or three factors; that it is usually an autosomal dominant (although the possibility that the gene for it may lie in the chromosome of certain families should be kept in mind), and that it is partially sex limited but variable in degree of expression, possibly owing to modifying factors."

In their summary, the same authors present the following:

"1. Radioulnar synostosis varies greatly in degree. these are: exostoses, clubfoot and clubhand, flatfoot, ab- the type in which the radius head is absent, the proximal end of the radius being fused with the ulna, and (b) the type in which the head of the radius is displaced toward the flexor side of the arm. The extent of the bony union varies from about 2 to 6 cms.

2. A comparative review of the mammalia shows that the radius and ulna are frequently united. This union is associated partly with their close proximity, so that any overgrowth of either bone may cause a permanent fusion of the two. When the use of the anterior appendage is not seriously interfered with, this union may become normal for a species, genus or family.

3. The radius and ulna develop out of the same precartilage plate, and, at a later stage, the perichondrium of the two bones is continuous at their proximal ends.

4. The abnormal developmental impulses which lead to synostosis are indicated by other bony defects in the propositus or his family. Among the commonest of these are: exostoses, clubfoot and clubhand, flatfoot, abnormally diminished growth of long bones, short stature and bowlegs; in general, dyschondroplasia.

5. There are genotypical differences in the various families, which thus belong to diverse biotypes. In one family (M.) only one gene appears to be responsible for the synostosis, and this acts much as though in the 6 chromosome (but this is highly uncertain). In most families, distribution is that of a two-gene trait; in one of the families, of a three-gene trait. The synostosis is always a dominant trait.

6. Males are twice as likely to be affected as females; and this result holds for bone defects in general.

7. Frequent lack of symmetry in the defect suggest that there is frequent imperfection of dominance.

8. Consanguineous matings are found in the synostotic families; and it is probable that they are especially frequent in them.

9. Radioulnar synostosis appears to be a dominant partially sex-limited trait, which varies in degree of expression."

The essayist has endeavored to find record of successful corrective treatment for this condition but in each of the cases reported in which surgical attempt was made to provide relief, the effort proved unsatisfactory.

## DISCUSSION

Dr. I. S. Trostler, Chicago: Mr. Chairman, I think this splendid presentation should not be passed without at least favorable comment, and while I have no definite data, I have had experience in breeding dogs for a number of years, of not a synostosis, but a defect which, as I recall, always occurred as a short left fore leg in about half the males. It never occurred in the females.

I had a very fine female water spaniel that I bred regularly. When it occurred we didn't know as much about this subject as we do now. I bred her to a prize

winning male the first time and got some fine dogs. I don't remember how many, but there were several of the first litter, the most valuable of the males, that had a short left fore leg. It was enough shorter that they would go down on one corner when they would walk, but did not affect the animal as a hunting dog or as a water dog.

I bred her the second time to the same male and got the same physical defect. Then my father, who was quite a student of that sort of thing, said, "Perhaps that comes from the father." So I bred her subsequently to other dogs and it always occurred at least once in a litter, showing that it was from the mother. As I remember it, it always occurred in the male dogs, and was always the same front leg. I am pretty sure it was the left front leg.

While I have not any means of giving exact figures, I would say that not less than one-third and probably more of the male "get" of that female dog had this same defect.

I want to personally thank Dr. Blaine for having presented this fine scientific paper.

Dr. Benjamin F. Gruskin: Dr. Blaine's paper is very commendable. In this, as in hemophilia, it is the female that transmits the trait to the male. It is probable that when conception takes place the female element is stronger than the male, and the latter is only a deviation from the former, and is more prone to carry with itself the weaker characteristics. Normally the Mendelian law does not transmit characteristic traits to the male only, both sexes indeed are subject to that law, but when some form of degenerative characteristic is transmitted it is prone to express itself to the deviated type.

Dr. Blaine: I think Dr. Trostler's remarks about the analogy are well taken.

In the case I am reporting, the patient insists there is not a history of any other involvement in his family. I venture the suggestion that he is unaware of other occurrences in his antecedents. From the study I have made of this condition it probably is an inherited trait that skipped a number of generations in which we have no record of its occurrence.

I appreciate Dr. Gruskin's favorable comments on the presentation. Finally, I wish to reiterate that while this particular case does not seem to follow the mendelian formula, it is probably a variant of it. If we do not get one hundred per cent. sequence of a given fault, I do not think we should conclude that it does not check up with the mendelian theory.

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# ACUTE OSTEOMYELITIS*

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*Introduction.* Advancement in medical science during the past generation has been phenomenal. It has more than set the pace in the course of human progress. It has added more to the sum total of the world's happiness and advancement and saved more lives than all the other sciences combined. However, it has not served the human race to the full extent of its capabilities.

The subject to be discussed now represents only too well the significance of the last statement. Acute infectious osteomyelitis is such a formidable disease and has wrought such wide destruction, is so frequently overlooked and allowed to go unchecked that I make no apology for bringing it to your attention again.

The clinical course of acute osteomyelitis is dramatic in the extreme and has left hundreds of ghastly monuments to the unsuspected neglect of this desperate disease. The various stages of the disease are quite well defined and the pathology of each process has long been a subject of common knowledge and yet the pictures presented, both clinical and pathological, as well as x-ray, are depressing beyond compare.

I will confine my remarks to the acute suppurative form of the disease and allow for some future date to discuss the atypical and chronic cases.

There are few diseases capable of producing such disastrous results when unrecognized or inadequately treated, while at the same time lend themselves to prompt and intelligent treatment, with the conserving of life and limb and returning the victim to an approximately normal state in a few weeks.

*Etiology.* A child suffering from some focal infection or the acute exanthemata, has received a slight trauma to his limb or been exposed to cold and you have all the "makings" of an acute infectious osteomyelitis.

As far back as 1880 Senn called attention to all the well known etiologic factors, as they are

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recognized today, and except for minor details the same principles now prevail.

The important factors are: Bacteriologically staphylococcus aureus produces about 78 per cent. of all cases, albus 2 per cent., streptococcus 6 per cent. and pneumococcus 14 per cent.

*Age.* No age is exempt but the great majority occur between the ages of 4 and 12.

*Focal infections* with the acute exanthemata, play the all-important roles and more especially superficial skin lesions, and bad tonsils.

*Slight trauma or exposure* to cold or both are quite essential.

*Anatomically.* The terminal loops of capillaries as they approach the epiphyseal cartilage are evidently the principal factor in the determination of the location and lodgment of the septic emboli. Starr and others have found clinically and experimentally that the process begins on the diaphyseal side of the epiphyseal cartilage where the greatest per cent. of septic emboli lodge in these capillary loops.

*Bones involved.* Statistics show that the femur is involved in 30 to 39 per cent. of cases, the tibia in 35 to 40 per cent., the humerus in 10 to 15 per cent. and the radius 5 and ulna 3 per cent.

*Pathology.* The pathology and pathogenesis have been well described by many authors over a period of a half century and very little that is new has been added in recent years.

The chief underlying conditions responsible for the development of acute osteomyelitis are the numerous minute capillary loops as they approach the epiphyseal cartilage of all the long bones and the large nutrient artery carrying such an abundant blood supply to the shaft of these bones, which brings clumps of bacteria or tiny septic emboli that are filtered out in the small capillary loops near the cartilaginous plate. It is doubtful if many cases arise by extension of the infection from the periosteum.

In adults the narrow tortuous vessels in the same region are probably responsible for the location of septic emboli, although some are doubtless determined by the congestion at the sight of trauma.

Given a focus of bone infection, as above described, and the same laws governing the progress of an infectious process, manifest here as in soft tissue, namely, leucocytic infiltration, local congestion and extension along the lines of least resistance. Compact bone and the epiphyseal cartilage prevent swelling, thus thwarting nature's attempt to wall off the process. This puts the offending bacteria about three paces ahead of the leucocytes at all times.

The great tension under which the infection exists, in the bone, forces the bacteria ahead through the first and second lines of defense and they may even be carried far back of the enemy lines by the blood stream. Here destructive activities are at once set up, again outwitting the leucocytes to the further disadvantage of the patient.

As this battle rages the infection is spreading along the lines of least resistance, namely, the epiphyseal cartilage to the periosteum and into the medullary cavity. When the compact bone is penetrated, further rapid extension beneath the periosteum soon leaves the bony shaft entirely separated from its food supply and death is the only alternative.

All this may take place in but a little more time than it has taken for me to describe it. Certainly within a period of 24 to 36 hours very extensive destruction of the bone may occur.

As many cases are undiagnosed for several days, so each day and even each hour, the process extends further beneath the periosteum and within the medullary canal, until a third, a half, or two-thirds of the shaft has been deprived of its blood supply in part or as a whole with partial or complete necrosis. Some time during this activity the periosteum gives way at one or more points and the infection begins its journey through the muscle planes and subcutaneous fascia seeking an exit through an intact skin which may not be accomplished for a month or more from the date of onset. In the meantime very extensive bone destruction has occurred.

Donaldson has shown that the causative organism may be found in the blood stream in 75 per cent. of cases. Where the process is due to staphylococcus aureus more extensive bone destruction is to be expected than from any other organism. He also claims that the staphylococcus rarely involves the joint while streptococcus frequently involves the joint and produces much less bone destruction.

*Symptoms.* With the essentials for an acute osteomyelitis as given under etiology, we find a

child with a sudden, severe onset of pain in a limb which localizes early near the end of the long bone, not in the joint. Pain, of rapidly increasing severity, is the first complaint, a pain far more severe than that of acute rheumatism or any other process in a limb. The pain is agonizing, deep, boring, continuous and increased by all movements, lowering of limb and pressure over affected area.

This cardinal symptom is accompanied in two to eight hours by a severe fever syndrome and prostration. Pulse and temperature rise rapidly to 140 and 103, respectively, within a very few hours. A high leucocyte count is found and a predominance of polys is to be expected. Lipuria has been noted by several authors and is considered by them to indicate medullary suppuration.

Objectively, aside from the above picture, there is only one thing that will complete the diagnosis in the early hours of the disease, and that is a definitely marked tenderness on long deep pressure over the diaphyseal side of the epiphyseal cartilage of the affected bone.

At this stage all local signs of inflammation are in abeyance. Swelling and edema are entirely absent and will not be manifest until such a time as the infection has found its way to the periosteum or even out into the muscles. This usually takes from eighteen to forty-eight hours, depending upon many pathological and anatomical factors. Some of these are: first, the primary location of the septic embolus; second, the density of the overlying bone; third, the virulence of the offending bacteria; fourth, the amount and type of overlying soft parts, that may obscure periosteal swelling.

At the end of a week or ten days or often a month when these cases are brought to the attention of the surgeon, we find the characteristics of a deep seated, ill defined and extensive inflammation, which simulates an acute cellulitis or phlegmon, a diagnosis not infrequently made in these cases. At this stage of the disease fluctuation is usually present within a very extensive swelling and often a discharging sinus is present, located far distant from the original site of the process. It is now that the patient presents a septic picture with a well established secondary anemia and the diagnosis is easily made by a careful history or an x-ray plate.

*Diagnosis.* Every physician, specialist or general practitioner should constantly bear in mind the possibility of this dreaded disease, when confronted by a sick child.

Negligence at such a time should be classed among the greatest offenses to which the medical man may fall heir.

Early, intelligent treatment, based upon accurate diagnosis and a well recognized pathological process should be within the grasp of all.

The direct diagnosis must be made on the history and physical findings as given above, as the x-ray and other laboratory findings give no positive aid.

The chief diagnostic points within the first 48 to 72 hours are:

1. Child in over 80 per cent. of cases.
2. History of some local or general infection.
3. History of slight trauma to limb or exposure to cold or both.
4. Sudden severe onset with excruciating pain and early prostration.
5. Ninety-five per cent. or more are on the diaphyseal side of the epiphyseal cartilage of a long bone.
6. Seventy-five to eighty per cent. involve the lower limb.
7. Marked tenderness on deep pressure over the site of pain.
8. X-ray is of little or no value in early stages.

*Prognosis.* Prognosis as to limb is about one hundred per cent. bad. As to life there are but few available statistics, but death is quite common. Schurer-Waldheim reports six fatal cases that died in from three to six days after onset.

Prompt and intelligent treatment offers an early return of function, conservatively estimated to be within three months.

Neglect and inadequate treatment produce a convalescence of a year to many years, often resulting in the loss of limb or chronic invalidism or both.

This disease probably destroys and disables more limbs than any other known.

Enlightenment of both physicians and the public concerning the seriousness of acute osteomyelitis should be greatly stressed.

*Treatment.* The next generation will witness the passing of the last of the acute infectious diseases and the various focal infections should

be so wisely treated that acute osteomyelitis would become one of the conquered diseases.

The treatment of this dreaded disease is always one of the most definite surgical emergencies in every instance and prompt rational operative procedures must take precedence over all other considerations. Time is all important and a few hours' delay may mean the sacrifice of a limb or a life.

The treatment of acute appendicitis, cholecystitis or fractured bones may well be postponed for a few hours but not so with acute osteomyelitis.

Soft tissue infections progress toward early localization, are treated conservatively, respond promptly to drainage, while the prevailing tendency in acute bone infections is distinctly opposite. Localization is not to be expected, wide extension and wholesale destruction are the rule. Conservative treatment brings disaster. Prompt incision, with removal of sufficient bony cortex to provide for exit of the inflammatory products, is rational. Thus certain principles maintain in the treatment of acute bone infections, but each case presents its own problems.

John Hunter in 1787, Brodie in 1846, Ollier in 1877, Senn and Bryant in 1879 all recognized the importance of early and wide incision of soft tissue and excision of bony cortex to obtain good results.

In more recent years other authors have stressed these points while still others have favored a conservative course.

In the light of our present knowledge of this disease there remains but slight excuse of any case not receiving radical and intelligent treatment within the first forty-eight hours after onset.

Wide incision of soft parts and extensive removal of bony cortex without destruction of the medulla is safe and sufficient in the acute stage of osteomyelitis.

## DISCUSSION

Dr. C. George Appelle, Champaign: The essayist has given us a very good paper on acute osteomyelitis Therefore, I will not burden you much but will make my remarks very brief, very simple and very direct. In contrast to the dramatic onset which the essayist has related to you, I wish to call your attention to the fact that not infrequently these cases have a very undramatic onset and with very disastrous results. I am not convinced that those cases with a dramatic onset are apt to give a more disastrous result than those whose onset is undramatic. To be a little more specific, a boy works on a farm for two or three weeks complaining of more or less pain and disability in the region of the shoulder. It is treated with household remedies and finally comes to operation as an osteomyelitis of the humerus. This sounds like a very undramatic onset but nevertheless, it was a case of osteomyelitis. Another case returns from school complaining of a little pain in the region of the groin, so insignificant that it is not regarded seriously for a week when severe nose bleed sets in. At this juncture the course becomes more dramatic and the case turns out to be one of very extensive osteomyelitis of the femur. These undramatic cases we are prone to call rheumatism and somewhat plausibly because almost always in these young people the lesion is near a joint. But as a counter balance to this fallacy just ask yourselves: "How many cases of monoarthritis have I seen in children?" These remarks are not by way of criticism of this excellent paper but rather to guard against the obsession conveyed in our schoolday lectures on osteomyelitis that there must be a dramatic onset so that when we see other onsets we are likely to overlook the true situation.

I want to emphasize how to use the x-ray in the diagnosis of acute osteomyelitis. It does not make any difference how early you see a case of osteomyelitis, whether in four or twenty-four hours, you should take an x-ray picture. However, even if the x-ray is negative it should have no influence as to how you are to proceed, always feeling sure that perhaps a simple incision and an opening into the cortex is not going to do as much damage as if you let a case of that kind go on without some such simple procedure.

The treatment has also been very excellently covered. Prompt drainage is necessary. In a case where the diagnosis is made early, perhaps very little is necessary in the way of destruction of the cortex. Perhaps a few simple drill holes will take care of it, but of course, where we see one of this kind we see several in which this is not adequate. However, you should never go into a case of osteomyelitis where there is extensive involvement of the marrow cavity, make a few simple drill holes and get out, and imagine that you have accomplished very much. I will grant that sometimes all you ought to do is to make a simple incision for emergency drainage. A good rule is to meet the indications as the situation seems to demand and complete the operation at your leisure under more favorable circumstances. Another thing which I think is significant in the treatment of some of these cases and that is the material used for drainage and the dressing. Ordinary rubber tube drainage appears to me to be inadequate. Other than this I do not know that it makes a great deal of difference what kind of drainage or dressing you use except that the vaseline gauze pack of Orr is perhaps the most comfortable and convenient. It is most easily applied and most satisfactory as to the frequency of change. It

matters not whether the disease involves the marrow extensively or the circumference of the bone, this dressing serves equally well. It is not imperative that a cast be applied and left on for six weeks without changing the dressing. You may change it every week if you see fit. Certainly some cases fare better under such management.

Fixation is important on two counts; the immediate comfort of the patient and subsequent disability. No one should presume that it is necessary to put every case into a cast. As a matter of fact, sometimes, body cast fixation is distinctly contraindicated. Some of these patients are in such a depleted condition that they will do poorly in a cast. Many of them have sufficient support in the bone itself that you need not worry about any immediate deformity of the limb. Apply such supporting apparatus as will give the greatest comfort and make the care of the patient reasonably easy. I should advise against a body cast in any severe, acute case because of the added handicap to an already profoundly depressed state. If all goes well you will have plenty of time later to apply a cast. Some cases can be handled from start to finish without the use of a cast, with good end results so far as the patient is concerned.

Dr. E. H. Ochsner, Chicago: I think Dr. Harger's report is very opportune. It is a very strange thing that every generation of physicians has to re-learn many of the things that previous generation of physicians had already learned. When I was an intern in the Cook County Hospital the general practice there was very extensive chiseling even in the acute stage and many of the cases either died from general sepsis because of too extensive operation or eventually lost the extremity. I saw quite a number in both of these groups. Shortly after that we learned that in acute cases if one gets them early enough all that is necessary is a wide incision of the overlying soft tissues and of the periosteum. I daresay if one gets the cases early chiseling is not necessary, and even the use of the gimlet is not necessary. I would say to the last speaker that a case that has to have four or five operations either comes too late or is not properly treated in the first instance. Whenever these repeated operations are necessary one of these two things has invariably happened. I do not see an acute case of osteomyelitis without my intern saying to me, "Why do you not chisel into the bone?" Nine times out of ten it is not necessary. By making an incision over the skin and an incision into the periosteum right over the point of tenderness, the patient will recover without the formation of a sequestrum in a considerable percentage of cases and in the remainder the sequestra can be removed at a later operation.

One more thing, that is the question of the x-ray. The second speaker said, take an x-ray. Yes, if you can take an x-ray without the parents knowing it, take it in the first twelve hours. If you cannot do it without the parents knowing it, do not do it, because they will ask you every time, "What did it show?" I never mention x-ray. I say that the patient has an osteomyelitis and it has to be operated on at once. I take the patient to the hospital and operate. I have seen cases where the x-ray resulted in delay and consequent great harm to the patient.

Dr. John R. Harger, Chicago (closing the discussion): Dr. Appelle made some very pertinent points. The dramatic onset of all acute infections depends on the virulence of the organisms and the resistance of the patient. In some of these cases the onset is very mild, but they are sure to progress and tend to destruction.

Regarding the x-ray, I like to have an x-ray for my case record. In the first case shown here the x-ray revealed nothing. Later on we obtained a picture showing findings, and so we had something definite and we knew the changes that had taken place. The x-ray for record is the reason I want it. On the other hand, because the x-ray did not show anything the parents hesitated about operation and the internist did likewise.

Speaking of incision, I like to make a wide incision in the soft tissues. I sometimes think an incision down through the periosteum is sufficient, but you cannot tell in all cases when you get through the periosteum whether that is enough. I do not destroy the medulla. I have at the present time a case at the County Hospital where the boy has a complete destruction of the tibial shaft because the first man who opened it simply went into the periosteum.

Speaking of the Orr method, I believe he has told us a great deal about drainage in surgery. I have known Orr since I was a student and I take him seriously. I am using vaseline gauze in lots of other places. I think it is a good thing. In small sinuses I always use vaseline gauze. In the acute cases I do not pack it in very tight.

Regarding fixation, I put a plaster cast on every one of these patients. Make it wide open, put on a handle so you pick the boy up and carry him around the ward, and he is perfectly comfortable. It prevents deformities, it relieves pain and puts the limb at absolute rest.

This case of infection of the upper end of the femur brought up a very serious question to me. There are a lot of cases reported in the literature at the present time of an acute epiphysitis. I am wondering if those cases are not like my case where the process was on the diaphyseal side before it was up in the joint. I have a patient under my care at the County Hospital with quite a little involvement of the neck of both femurs, bilateral ankylosis. In one the process has gone down below the trochanters. I believe in this case the process was not in the epiphysis primarily. I believe originally it was in the diaphysis and found its way, because of the capsular ligament, into the hip joint.

# HERPES ZOSTER, SOME REMARKS ABOUT ITS TREATMENT*

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Herpes zoster is characterized by an eruption of reddish patches, of varying sizes and shapes, which are almost always surmounted by groups of vesicles, limited often to the territory of a single nerve and unilateral save in very rare instances. Its evolution is cyclical and it seldom recurs. The lymph glands adjacent to the affected areas are practically always enlarged, sometimes even before the appearance of the eruption. Pain is often intense, being burning or neuralgic in character. The patches are often hyperesthetic. In older persons the pain may persist for months after the healing of the skin lesions. Aberrant vesicles have been observed, but Darier, who has made a special study of them believes them to be a rarity. Since pain is the chief symptom its relief is the most important indication. The large number of remedies which have been suggested shows that no one of them appears to be successful in all cases.

I shall not consider all of the treatments which have been employed, but shall limit myself to a discussion of the more recent ones. Schamberg, Darier, Milian and Alderson are among those who have recommended deep x-ray therapy. Howard Fox[1] has seen good results after the local application of a paraffin mixture. Jacobson[2] in twelve cases obtained satisfactory results by the daily use of a 1000 watt red globe, for twenty minutes each time. From two to six such applications healed the cutaneous lesions and removed the pain. Ultra violet has also been valuable. Ruskin[3] was successful in a case of herpes zoster affecting the right ear drum, with the use of a 10 per cent. cocain solution applied to the corresponding spheno-palatine ganglion. Vendel[4] of Copenhagen recommends the subcutaneous administration of pituitary extract. Sutton, in the recent edition of his text-book, found it of little value. Duke[5] favors the subcutaneous injection of epinephrin which he believes to be of distinct value for the relief of pain in zoster; 0.50 c.c. is given every five minutes until the patient is relieved or until a distinct tremor appears. This agent has little effect upon the skin lesions. Galliot[6] treated two cases of zoster occurring in old syphilitics with intramuscular injections of bismuth, with good success. In the ensuing discussion before the French Dermatological Society Schulman emphasized the importance of syphilis as a possible etiological factor in the production of herpes zoster. He referred to its occurrence after the use of arsenical preparations in the treatment of syphilis and stated that in his opinion such zosters are really neuro-recurrences which will respond to further anti-luetic therapy. Sezary, referring to the cases of Galliot, believed that they represented an awakening of the unknown zoster virus under the influence of the bismuth. Lhermitte and Kyriaco[7] have presented before the Paris Neurological Society a report which emphasizes the role of syphilis in zoster. In thirty-three cases of herpes zoster they found that lues was present in twenty-four of them. After a striking result in a case of zoster occurring in secondary syphilis Milian recommends the intravenous use of Neo-Arsphenamin and quotes five zosters, in those apparently free from syphilis, in whom this drug gave excellent results. A 0.30 gm. dose usually afforded considerable relief, even dissipating the pain entirely in several cases. Relief from pain was noticed even within three or four hours. From Montpellier comes the report of a quick cure in a very painful zoster by the intravenous injection of iodobenzomethylformine.[8] The pain disappeared twenty-four hours after the initial treatment. Treatments were given daily for four days and by that time the skin lesions had largely faded away. This result, the abstract states, is confirmatory of the results gotten by Ganzinotty. Benard and Joltrain[9] obtained good results in eleven out of fourteen zosters by the intravenous administration of the strongly sulphurous but isotonic water from the springs at Uriage, France, in 10 c.c. doses.

In 1923, Ravaut[10] and a little later, Spiethoff,[11] were the first to employ autohemotherapy for the treatment of skin diseases. This procedure consists in the withdrawal of venous blood just as for a complement fixation test, followed by its immediate injection into the patient's

*Read before the Aux Plaines Branch, Chicago Medical Society, March 1, 1929.

gluteal muscles, preferably those of the upper and outer quadrant. The amount of blood used varies from five to twenty cubic centimeters, the first named amount being suitable for children. More than twenty cubic centimeters is apt to cause considerable pain and one-half of that is the usual adult dose. As a rule, these injections are well borne, a slight fever or pain at the site of injection being occasionally noted.

Spillmann and Raspiller[12] of Nancy, in 1923, first employed this method in the treatment of herpes zoster, with uniformly good results. In six of their seven cases the first injection caused an almost complete cessation of pain and a rapid clearing up of the eruption, the vesicles drying up in from twenty-four to forty-eight hours. The results were especially gratifying in two patients aged seventy and seventy-one years, respectively. None of their patients suffered from postzosterien neuralgia.

Parisot and Simonin,[13] Drouet and Vernier[14] and Etienne, all of Nancy, have likewise reported excellent results from this same treatment in zoster. Drouet and Vernier first treated ophthalmic zoster in this way and they were very successful. Their patient was given five autogenous blood injections at two-day intervals, the dosage ranging from five to twenty cubic centimeters, the latter amount being given twice. The first injection removed the photophobia and after the third one the cornea had largely cleared. Six days later it had regained its normal transparency.

Wintzer[15] of Nantes has reported most gratifying results from autohemotherapy in eighteen cases of herpes zoster, two of them with ophthalmic involvement. He treated two instances of post zosterien neuralgia with this same method but without success, even though one patient received seventeen such treatments.

In discussing the results obtained by Bernard and Joltrain, Sicard said that such treatments as the use of autogenous blood could give remarkable results in zoster, but that it must be used early, preferably during the first seven to ten days. If not used until later neuralgia is apt to follow.

Barrio de Medina[16] of Madrid, Spain, has also used autohemotherapy with success in herpes zoster.

*Personal results.* I have treated eight cases of herpes zoster solely with herpes zoster and the results in seven of them were excellent.[17] In the last case the treatment was instituted a little too late, which probably accounted for the failure. The usual dose was ten c.c. of autogenous blood, given every three or four days. Only the last case showed any post zosterian neuralgia. In several patients the initial treatment entirely relieved the pain and brought about a quick evolution of the skin lesions. In two of them aged sixty and sixty-five, respectively, with very severe pain and extensive skin involvement, three injections given within ten days effected an almost complete cure. I have also noted a favorable effect upon the enlarged lymph glands following autohemotherapy. The effect upon the pain is more rapid, however, often causing its disappearance within twenty-four to forty-eight hours. All of my cases were treated early save the last one.

*Theories regarding the action of autohemotherapy.* Wintzer believes that the various theories concerning it are based on sensibilization or desensibilization. It is thought to be a form of protein therapy by some. Wintzer states that the leucocytosis which it produces plays an important role, but that the mechanism of this procedure is not yet entirely understood. Raspiller has compared its action to that of a peptone. Moutier and Rachet[18] showed that it produced a hemoclastic reaction in eleven out of fifteen patients. This was followed by a hyperleucocytosis within one hour. Paillard[19] has suggested that the venous blood which is injected into the cellular or muscular tissue is slowly absorbed by the lymphatics and that perhaps this passage through the lymphatics produces favorable defense reactions. Spillman is joined by Louste, Thibaut and Barbier[20] in the belief that autohemotherapy should be classed with the methods of nonspecific desensibilization.

*Conclusions.* Autohemotherapy is deserving of wider recognition in the treatment of herpes zoster by reason of its simplicity, apparent freedom from serious reactions and because of its good effects in a number of such cases.

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## THE PHYSIOLOGY OF THE EPIDIDYMIS

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What is the function of the epididymis? While many observations have been made by various investigators, the final purpose has not, as yet, been attributed to this seminal duct. In animals, who possess no seminal vesicles, the epididymis apparently functions in three ways, as follows:

First: As a reservoir for the products of the testis.

Second: In the capacity of a duct or tube for the passage of male sperm and testicular fluids.

Third: As a secreting gland.

In order to verify the first and second functions, we have but to study the quadrupeds. Frequently, there are revealed collections of spermatozoa in the epididymis, particularly in the tail, which obviously assumes the role of seminal vesicle in the lower animals.

The ornithorhyncus, or duck-mole, a small oviparous mammal of Australia, does not possess any seminal vesicles. Here we find the lower end of the vasa deferentia considerably enlarged, no doubt to compensate for the entire absence of seminal vesicles.

In the human, aspiration of the epididymis, or one of its aberrant ducts (spermatocele) discloses that here also the organ functions as a reservoir and duct.

Among the monotremata, including the anteater, hedgehog and duckbill, the seminal vesicles are absent. Birds also are devoid of this organ. Other seminal glands, such as Cowper's, the prostate and epididymis, assume this role. This ability of one gland to substitute for another is particularly marked in the civet cat, in whom we find Cowper's glands enormously enlarged to provide for the total lack of seminal vesicles; and in the guinea pig the converse is true. Apparently, there is something in common, then, among this group of sex glands.

The glandulae seminales in the white rat are two large sac-like structures usually possessing one chamber but occasionally partitioned off into several. They are in no way connected with the epididymes and open by individual ducts into the posterior urethra. Their function is apparently purely secretory.

The pelvic and anal glands among certain of the batrachians swell up during the procreative season, and discharge their secretion into the cloaca. These glands are supposed to represent the prostate and glands of Cowper. This congestive phenomenon has been observed in snakes, birds and mammals, who have a rutting season and includes the epididymis which increases greatly in bulk, its lining cells becoming more numerous and larger and its contents greater during the mating term; and with the passing of this period, the substances are expelled, its bulk and secretion subsiding to the antenuptial dimensions.

The epididymis of man, whose mating season includes at least 365 days each year, does not

present seasonal variations; yet how similar the swelling, tenderness and even pain in the organ following prolonged ungratified sexual excitement. Is there, then, a stimulated activity, an increased accumulation of secretion to such proportion as to cause overdistention, tenderness and even pain! This is not an uncommon occurrence, and the Germans picturesquely describe it as Bräutigams epididymitis.

In the human who does not possess other secretory glands, in addition to the prostate and Cowper's, why can we not assume, after studying the comparative anatomy, and after noting the similarity between the mating season in the lower animals and the increased activity of the epididymis during the prolonged ungratified sexual excitement that this organ has a secretory function?

In other animals, in the absence of special accessory glands called glandulae seminales, either Cowper's, the prostate or the epididymis assumes a secretory activity. The human seminal vesicles are not secreting glands. The prostate and glands of Cowper in the human are not particularly large compared to these glands in lower animals.

Belfield and Rolnick, working on the seminal ducts, found that following the injection of various colored chemicals, the body of the epididymis was colored, and thereby concluded that it functioned like other secreting glands as an excretory organ of certain foreign substances introduced into the blood.

Why, then, in view of all this evidence we have a secretory power of the epididymis in lower animals can we not conclude that the epididymis in the human is invested with a similar secretory function?

From the Nelson-Morris Institute of Research, Michael Reese Hospital.

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## MASSIVE UNILATERAL HYDRONEPHROSIS*

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I have selected for discussion a study of thirty-three persons in whom there was found a large unilateral hydronephrosis not associated with renal or ureteral stone, neoplasm, tuberculosis or abnormal renal mobility.

The etiology of this condition is, and has been, the occasion of continued controversy on the part of both pathologists and clinicians. The three theories which are advanced to explain these large renal pelvis dilations are, in brief: Deficient or improper drainage, due to obstructive factors of a mechanical nature; a congenital localized tissue overgrowth resulting in an excessive and abnormally large renal pelvis; a congenital or acquired abnormal or deficient innervation of the renal pelvis which results in an alteration of the physiologic activity of the renal pelvis with subsequent dilation.

This small, but carefully selected group of patients has been analyzed in an attempt to add to the correlation of etiology and therapeutic consideration from the standpoint of the clinician. All were seen in the past nine years.

*Age.* The youngest was fourteen years of age, the oldest sixty-five years.

| | |
|---|---|
| 10 to 20 years | 5 |
| 20 to 30 years | 14 |
| 30 to 40 years | 7 |
| 40 to 50 years | 4 |
| 50 to 60 years | 2 |
| 60 years | 1 |

*Sex.* Twenty-two were men and thirteen were women.

*Location.* The right kidney was affected in twenty-one, the left in fourteen.

*Duration of Symptoms.*

| | |
|---|---|
| More than five years | 6 |
| Less than four years | 2 |
| Less than three years | 3 |
| Less than two years | 12 |
| Less than one year | 10 |

### *Character of Symptoms*

*Subjective.* In twelve there was frequent intermittent acute lumbar pain, radiating to abdomen groin, perineum or thigh.

Eleven gave a history of dull renal or lumbar

*Read at Peoria, Illinois, before Section on Surgery, Illinois State Medical Society, May, 1929.

pain or discomfort without radiation to abdomen, groin or thigh.

Seven complained of localized or vague abdominal discomfort without lumbar or referred pain.

Two had never had pain at any time, their symptoms being fatigue, drowsiness and anorexia.

One had experienced pain solely in the midpelvic and vaginal region.

In none was there a history of pain radiating to the shoulder or upper costal region.

The onset of pain was most variable. Thirty placed no connection between the pain and type of diet, exercise, bowel movement or other activity.

In three the pain was markedly aggravated by exercise or manual labor.

*Urinary Symptoms.* Intermittent attacks of frequency of urination was a complaint of seven. Three stated that there had been slight dysuria with occasional urgency. In twenty there had been no subjective symptoms referable to the urinary function.

*Objective Symptoms.* Three gave a history of elevated temperature on occasions associated with pain. Palpable lumbar or abdominal tenderness had been present in twenty-two. Four patients had palpated a mass in the abdomen.

The urine findings were normal in twenty-six.

Albumin was present in the urine of five, pus in six, erythrocytes in three, and a frank hematuria in one.

Urine cultures from the hydronephrotic side yielded bacillus Coli in four; B. Coli, staphylococcus and streptococcus in one; and staphylococci alone in one.

*Cystoscopic Findings.* The bladder was normal in twenty-four. In nine there was hyperemia of the trigone or bladder mucosa.

*Renal Function.* As tested by phenolsulphonephthalein or indigo-carmine injected intravenously all of the thirty-three kidneys showed a retarded appearance time and quantitative output of the dye. In eight no trace of dye appeared in thirty minutes.

An attempt was made to estimate the amount of retained urine by aspiration with a special syringe after ureteral catheterization.

In twenty-six a free aspiration of abnormal quantity was obtained. The largest amount so aspirated was 3800 c.c. and the smallest was 90 c.c.

*Diagnosis.* The positive diagnosis was made by ureteral catheterization, aspiration of the pelvic content, lowered output of dye on the affected side, and by pyelographic outline. An enlarged shadow suggesting kidney outline was noted on the uninjected plates in fourteen instances.

The pyelographic outline showed the dilation confined to the pelvis and calices in twenty. There was dilation of the ureter, pelvis and calices in thirteen. Of these latter the region at which the dilation apparently commenced was the upper third of the ureter in three, the midureter in six, and the lower ureter in four. In ten patients the emptying time of the renal pelvis and ureter after filling with opaque medium was determined. The opaque material remained long enough to cast an outlining shadow for from twenty minutes to thirty-six hours. (The normal emptying time is usually from five to ten minutes.)

*Treatment.* Nephrectomy was done in eighteen.

Ligation of anomalous vessels (where a bipolar blood supply was not present) and nephropexy seemed adequate in two.

Partial resection of the pelvis and re-implantation of the ureter was done in two.

Progressive ureteral dilatation by bougies through the cystoscope was the only treatment in nine.

*Pathology.* 1. Based on observation at operation together with examination of the extirpated kidney.

(a) Dilatation *without* evidence of extra or intramural mechanical obstruction—*two.*

(b) Narrowing of uretero-pelvic juncture or ureter without anomalous vessels—*seven.*

(c) Apparent obstruction at uretero-pelvic junction associated with pressure of anomalous vessels—*eight.*

(d) Abnormally high insertion of the ureter into the pelvis—*one.* In this instance there was no constriction of the uretero-pelvic juncture and the distorted position of the outlet may have been secondary to a condition such as found in (a).

2. Pathology as diagnosed by roentgenograms in patients not operated upon.

(a) Obstruction at uretero-pelvic region—*seven.*

(b) Ureteral narrowing (stenosis or stricture?)—*eight.*

*Results.* In the eighteen nephrectomized patients there have been no further complaints to date. One patient in whom ligation of the anomalous artery and nephropexy was performed is completely well symptomatically, but I have never been able to re-check the renal function or the pelvic outline. The second patient subjected to this procedure had partial relief for one year but returned for check-up which showed improved renal function as tested by dye, decrease in pelvic retention from 180 c.c. to 40 c.c., but a delayed emptying time of thirty minutes. No pre-operative test of emptying time had been made. The ureter was progressively dilated to 14 F. with complete relief of pain for periods of three to four months. The renal function has continued to improve as tested by dye output but a permanent cure has not been obtained.

Both patients in whom resection of the pelvis and transplantation of the ureter was done have had complete relief of pain. Unfortunately I have not been able to study either of these patients postoperatively, although it is four and two years respectively since operation.

Of the *nine* patients in whom progressive dilatation of the ureter to 12 or 14 F. was the only method of treatment, five are completely relieved of pain after six years, four years, four years, three years and two years respectively. I am sure of the condition of these patients because they continue to report at intervals. Two, still under my observation, have been partially relieved by bougie dilatation but present themselves for further treatment at four to six months intervals. To one of these I have repeatedly advised nephrectomy but she refuses on the ground that she is better than she was four years ago. Another patient claims complete relief from dilatation when the interval is not longer than three months. This despite the fact that the kidney function has improved to within normal limits and the pyelogram shows marked contraction.

One patient in this series has not been seen or heard from for two years. He refused a plastic operation and had no relief from dilating the ureter to 10 F. He has probably been readvised elsewhere.

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## CLINICAL EVIDENCE ON THE QUESTION OF MOVABLE KIDNEY*

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*Definition:* Every kidney is normally movable, making its excursions up and down with respiration or with movements of the body. But when that mobility is extreme, or when the kidney becomes displaced and remains in its abnormal position it enters the domain of pathology and is usually, though not always, accompanied by a train of symptoms, pains and reactions that

No. 1. Nephroptosis with Pyonephrosis.

*Read before Section on Surgery, Illinois State Medical Society, at Peoria, May 21, 1929.

should be readily recognized by one versed in the subject. Such mobility is termed movable kidney, loose kidney, ptosed kidney, floating kidney, or nephroptosis. The term floating kidney is used to designate the severely movable organ that is more or less enveloped by peritoneum, thereby possessing a mesonephron, and hangs especially loose in the abdomen.

Movable kidney seems to have had a variable career in the estimate of the profession in the comparatively short time since Glénard, in 1885,

No. 2. Same case as No. 1 four weeks following nephropexy showing kidney in proper place and restoration of normal markings of calices and ureter.

described it and its various sequences. For a time nephropexy had a vogue amongst many of the profession, and a large number of operations and methods for its correction were submitted. Either because these proved ineffective in numerous instances or because diagnoses were incorrect, failures in considerable number were recorded and a bad impression resulted. And latterly many surgeons have discontinued such work and some even decry it. In view of the clinical and radiographic evidence herewith submitted we believe this view to be unjustified and that the proper correction of malposed kidney offers wonderful relief to the suffering humanity whom it afflicts; and, further, that such correction is both effective and enduring.

We have never had a relapse in any case in which we have operated. And many others have been given relief by abdominal binders to such a degree that they have declined operation as being unnecessary.

*Diagnosis:* We have abandoned as unreliable the practice of resting our diagnosis on abdominal palpation for confirming the suspicion of movable kidney. We utilize the much more positive method of injecting the kidney pelvis and ureter with sodium iodide solution for ureteropyelogram, first while the patient is lying down and next while she is sitting up. The comparison between the two shows definitely the amount of excursion which the suspected kidney makes up and down in the two positions, and also any deviations in the caliber of the ureter or kidney-pelvis, kinks, angulations, etc., of the former, and distention or enlargement of the latter (hydronephrosis, etc.). If this practice were followed probably fewer cases would be operated on for appendicitis in which the real cause of the pain is a ptosed kidney with kinked and obstructed ureter.

*Symptoms:* A complete review of symptoms connected with movable kidney would consume many pages and is impracticable for this paper; but they relate to disturbances of the alimentary tract, liver, nervous system, urinary and pelvic organs, general health, mental conditions, backache, melancholia, etc. And in our cases they have varied in duration from one to twenty-five or more years, so severe in many instances as to require the repeated use of morphin. While we have the complete records of forty-five cases relieved by various methods, a few typical cases are herewith presented in which the radiographic and clinical evidence is clean-cut and indisputable. In addition to the pyelographic evidence acquired before operation, the actual condition is again checked up *after* operation, the result of which will be shown in individual cases.

Some typical cases are the following:

Mrs. C. Hopkins, aged 54, referred by Dr. Wm. H. Vogt, St. Louis, April 10, 1928. Symptoms eight years. Pain in right renal region and severely painful urination. Slide: (Fig. 1.) Right kidney opposite pelvic brim; obliterated calyces, dilated kidney pelvis and ureter. 'Thalein function only 2% in thirty minutes,

showing the damaged state of this kidney. Nephropexy, May 3, 1928. Pyelogram (Fig. 2) taken a month later showed the kidney in its normal position with its calyces restored and the pelvis reduced to a normal size; the ureter straightened. The patient had meantime been relieved of symptoms and was on the road to renewed health and weight—for the first time in eight years.

Mrs. J. Schroeder, aged 52, referred by Dr. L. M. Riordan, St. Louis. Symptoms ten years, attacks of pain, nausea and vomiting. Pyelogram before and after operation showed (a): Hydronephrosis and ptosed right kidney; kinked and obstructed ureter, (b) after operation; kidney restored to its proper position; pelvis in correct position for good drainage, decreased in size, ureteral kink removed.

An even more marked case is that of seventy-year old Mrs. Keiner who suffered for more than twenty years with supposed "lumbago," eventuating in attacks so severe as to require morphin hypodermics repeated for several days and nights. The attacks simulated those of renal colic. She was in one of them when I was first called called; and was writhing in the bed, with many excited members of the family standing about.

A ureteral catheter passed readily into the right kidney pelvis, draining out an ounce of foul, infected retained urine. Relief from the agonizing pain was immediate. A pyelogram taken with the patient lying down is shown in slide No. 5, revealing the kidney in its proper position but with dilated pelvis; while slide No. 6 shows the pyelogram with the patient in the upright position. The kidney has dropped nearly to the brim of the pelvis, with the kidney-pelvis dilated into a nephrotic state, the plain evidence of chronic obstruction and back-pressure that caused the pain. Nephropexy, October 22, 1928, gave entire relief and restored the general health—after twenty years of suffering.

The history of a little girl, Everlyn Organ, four years of age, is of great interest. Her physician, Dr. Joseph Costello, St. Louis, said she had suffered from pyelitis, with pain in the left side, infected urine, chills and fever and bad health for the most of her young life. Her youthful age did not deter us from making the required cystoscopic and x-ray examination, the result of which appears in slide No. 7. The left kidney was shown ptosed down into the pelvis, the ureter congenitally shortened to a degree that prevented all thought of restoring the kidney to its normal position in the flank. So no operation was considered; but cystoscopy, ureteral catheterization with dilatings and lavages were repeatedly carried out in our office on the little four-year-old girl, under local anesthesia and without a murmur—except one day when she protested because she was "getting hungry." Recovery followed in about two months.

The calamitous result of neglecting to attend to ureteral obstruction from ptosed kidney is shown in slide No. 8. Mrs. Weed, aged 52, suffered for twelve years with agonizing pain in the left side, notwithstanding her faith in the efficacy of Christian Science for relief. At the end of the twelve years her left kidney had been so destroyed by back-pressure and infection that it was a mere septic pus-sac, and required nephrectomy without question. Relief followed the operation, but the thought intrudes itself as to how much better it would have been to have detected, corrected and *saved* the mal-posed kidney twelve years before it had to be removed. The worst situation of this sort I have ever seen was that depicted by slide No. 9, of a young bride, twenty-three years old, whose right kidney had been removed surgically a year before I saw her. What she had to depend on for renal excretion was the one dilated, pyonephrotic kidney shown in the slide, together with the dilated, kinked, strictured, looped and angulated ureter pictured. The sword of Damocles was as

No. 3. Pyelogram taken with patient in prone position.

nothing compared to the perilous position of this little bride. Her one kidney was almost inert and functionless, and had for drainage a monstrosity of a ureter, malformed and strictured to the N'th degree. Nephrostomy was the only thing left for this case. Early conservative surgery would doubtless have saved the situation.

Slides No. 10 and 11 show Kelly's method of suturing the kidney into its proper position: A chromic 20-day catgut suture including a triangular portion of the kidney on its posterior aspect, the ends passed up under the 12th rib and out through the intercostal muscle and tied together with the kidney placed high in its fossa. Two other sutures are similarly placed and passed

through the quadratus lumborum muscle, posterior margin.

## CONCLUSIONS

1. Movable kidney is a reality both clinically and pathologically and demands prompt recognition and appropriate measures of relief.

2. Such recognition is to be based on the modern methods of examination described.

3. Diagnosis requires proof on two points in particular: (a) As to the presence of unduly movable or displaced kidney. (b) As to whether the symptoms complained of are coming from this displacement or mobility.

4. Methods of relief are both palliative and surgical: Abdominal binders and nephropexy, the latter affording permanent results when properly carried out.

5. Binders are effective only as long as they are worn, no cure or permanent relief being afforded by them.

6. The "fattening" methods of treatment offer no probability of success and are pure waste of time.

7. No operation in surgery affords a greater measure of relief in proportion to its simplicity and safety than does nephropexy properly applied and carried out. Some husbands commend it as preferable to exchanging old wives for new.

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## DISCUSSION

Dr. E. H. Ochsner, Chicago: I am very glad to hear Dr. Lewis' paper. I have practiced surgery long enough to know that twenty or thirty years ago a good many people had nephropexy who did not need it and consequently received no benefit from the operation. They simply had a movable kidney and the symptoms were caused by appendicitis or gallstones. I think it was because of the fact that many patients were operated upon who did not need operation that nephropexy got into disrepute We now have a definite means of finding out whether a movable kidney is giving trouble and if there is definite kinking of the ureter with consequent urinary stasis an operation is certainly indicated.

I would like to ask Dr. Lewis whether he believes that simply scarifying the capsule is as good as splitting it and reflecting it, and possibly rolling it up as advised by Edebols.

Dr. Bransford Lewis, St. Louis, Mo. (closing the discussion on his paper): It is very gratifying to hear these expressions and I thank Dr. O'Conor and Dr. Ochsner in particular for expressing what I wanted to say, that the tide has turned because we now have modern and exact methods of diagnosis, based on which we can advise certain plans to be followed. They used to guess and look wise and say, "It is a movable kidney." But that guessing method has been thrown out and the diagnosis now rests on exact methods of cystoscopy and radiography. I have presented this subject on several different occasions in several different localities and it has always been received at first with skepticism but later with conviction that I was right.

The conclusions are based on the definite, positive and conclusive evidence in regard to diagnosis; and in the second place, the efficacy of the operative methods utilized.

## SEPARATE ADDITIONAL LIST OF SLIDES

12. Mrs. Baer, aged 47. Arrived May 28, 1928. Marked ptosis, kinking at uretero-pelvic junction. Symptoms six years. Binder, relief.

13. Mrs. Thornburg, aged 44. Arrived in 1925. Symptoms

No. 4. Same case as No. 3 with patient in upright position showing ptosis of kidney with resultant kink of ureter. Corrected by nephropexy.

five years. Ptosis; kinking of ureter (right) and strictures. Binder, relief.

14-15. Mrs. Lee, aged 46. Arrived Aug. 27, 1928. Symptoms twelve years. Ptosis right kidney (14) accentuated by erect posture (slide 15) with marked kinking of ureter, dilated kidney pelvis. Nephropexy gave complete relief.

16. Mrs. Linton, aged 61. Arrived July 28, 1928. Symptoms eight years. Marked ptosis and kinking. Relieved by nephropexy.

17. Mrs. Ryan, aged 51. Arrived Sept. 24, 1928. Symptoms five years, growing more intense all the time; invalidism. Marked ptosis and kinking. Relief and restoration by nephropexy.

18. Mrs. Muenteferring, aged 29. Arrived Aug. 28, 1928. Symptoms five years. Ptosis *left* kidney, hydronephrosis, marked kinking. Nephropexy and relief.

19. Mrs. Pansy Gibson, aged 38. Arrived May 22, 1926. Symptoms a year but rapidly growing worse. Ptosis, hydronephrosis, marked kinking. Completely relieved by nephropexy, June, 1926.

20. Mrs. Lemex, aged 51. Arrived Oct. 20, 1926. Symp-

toms five years. Marked ptosis, hydronephrosis, invalidism. Relief from nephropexy Nov. 21, 1925.

21. Mrs. Roe, aged 35. Arrived Dec. 12, 1927. Symptoms two years, but destroyed left kidney (pyonephrosis) ptosis, kinking. Relief from nephrectomy, Dec. 23, 1927.

22. Mrs. Higginbotham, aged 58. Arrived Feb. 19, 1929 (No. 1), Prone. Right ptosis, hydronephrosis.

23. Mrs. Higginbotham (same). Upright, kidney down in pelvis. Nephropexy.

24. Miss McCormick, aged 22. Arrived Feb. 21, 1929. Symptoms three years (No. 1). Upright. Hydronephrosis with kidney at brim of pelvis.

25. Miss McCormick (same) No. 2. Four weeks after nephropexy, kidney in proper location, its pelvis recovering proper contour. Recovery.

26. Mrs. Della Tate, aged 36. Arrived May 1, 1929. Symptoms eight years. Operations without relief ("Irishman"). Marked hydronephrosis and sharp kink, agonizing pains.

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## THE DISTURBANCES OF URINATION IN THE FEMALE CAUSED BY LESIONS OF THE LOWER URINARY TRACT

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This paper has been limited to the lesions of the lower urinary tract because time would not permit the inclusion of upper urinary tract pathology.

The common disturbances caused by lower urinary tract lesions are frequency, urgency, dysuria, pain, hematuria, pyuria, and incontinence.

A fair percentage of women are disturbed by one or more of these symptoms, either intermittently or continuously. This is due to: 1. The rather common lesions of the genital tract which disturb the urinary act. 2. The exposure of the urethra and secondarily the bladder to trauma and bacterial invasion. The trauma resulting from instrumentation and labor are only too common and the exposure of the urethral mucosa to the flora of bacteria which inhabit or gain entrance to the vagina is well known.

The limited sphincteric action in the female and exposure of the single sphincter to trauma also explains the frequency of urinary disturbances in their sex as compared to the male. In addition to these anatomical conditions, the female is subject to practically all of the lesions found in the male excepting those of the prostrate gland and seminal vesicles.

These urinary disturbances may be caused by:

1. Lesions outside the urinary tract.
2. Lesions in the urinary tract.
3. Lesions caused by faulty innervation.

Of lesions outside the urinary tract the following may be mentioned:

1. Cystocele and uterine descent with ptosis of the pelvic organs.
2. Tumors or enlargements of the uterus or adnexa.
3. Infections such as pelvic abscess, and salpingitis.
4. Tumors developing in organs outside of the bladder, such as the uterus or bowel, and growing into the bladder.
5. Tumors and diverticula of the bowel, which become adherent to the bladder, or break into the bladder and form fistulae.

Of lesions in the urinary tract the following may be noted: Congenital or acquired atresia of the urethral meatus; hypospadias, caruncle, papilloma, papillary carcinoma and diverticulum of the urethra; acute gonorrhea; acute non-specific urethritis; periurethral abscess; chronic urethritis; stricture of the urethra; foreign bodies in the urethra and bladder; trigonal cystitis; incontinence of urine due to poor sphincteric control or caused by faulty innervation; the various forms of cystitis, many of which are secondary to infections of the upper urinary tract; ulcers of the bladder such as tuberculous ulcers, simple ulcers and elusive or linear ulcers; tumors of the bladder, benign and malignant; leukoplakia; diverticula, and stone in the bladder.

A detailed account of any one of these lesions would make sufficient material for a paper in itself, and in order to keep within the time limit I have elected to discuss the following conditions: Cystocele; chronic urethritis and trigonal cystitis; stricture of the urethra; incontinence due to faulty sphincteric action; and elusive ulcer of the bladder.

These conditions have been selected because they are frequently responsible for disturbances of urination and are often overlooked.

1. *Cystocele.* This is a herniation of the bladder into the vagina and is usually associated with rectocele and descent of the uterus.

When this condition is well advanced it forms a pouch in the bladder which makes the completion of urination difficult or in some instances, prevents complete emptying of the bladder. If this occurs, we have to deal with a condition resembling prostatic obstruction in the male, in that there is a pouch below the

internal urethral orifice which holds urine after the completion of the act of urination.

This retained urine, as in prostatic obstruction, causes frequency, and a feeling as though the act had not been completed. When this residual urine becomes infected, which is not uncommon, cystitis develops with the associated characteristic symptoms of pain, urgency, tenesmus, pyuria and hematuria.

The cystoscopic picture is quite characteristic. There is a pouch below the internal urethral orifice and more or less trabeculation of the bladder wall, due to the over work of the musculature attempting to empty the pouch. There is injection of the bladder wall when infection occurs.

When the hernia is corrected by some plastic procedure, this pouch disappears as do the symptoms.

2. *Acute and chronic urethritis and trigonal cystitis.*

There are few adult women who have not had some infection of the urethral mucous membrane. When they are infected by the gonococcus, the urethra is the most common location of the infection. Also the bacteria which inhabit or gain entrance to the vagina not uncommonly invade the urethra and produce a urethritis with urinary disturbances such as frequency, urgency, pain, pyuria and sometimes hematuria. Acute hemorrhagic cystitis is not infrequently secondary to acute urethritis. This condition comes on suddenly with pain, frequency, urgency, tenesmus and severe hematuria. These patients rarely have a rise of temperature, which is true of most infections that are limited to the bladder mucosa. On cystoscopic examination the bladder mucosa is covered with areas of submucous hemorrhage, and in the more severe cases, blood can be seen oozing from the bladder wall.

Following these acute infections, the more chronic type of urethritis and cystitis may persist for long periods of time with the associated symptoms.

In these chronic cases the bladder mucosa may appear quite normal on cystoscopic examination, but there is often a marked injection of the trigone and urethral mucosa.

These cases are usually classed as trigonal cystitis and are often quite resistant to treatment. They may be relieved by the application of silver nitrate solution to the mucosa of the urethra and trigone through a urethroscope or by placing a cotton applicator moistened with the same solution into the urethra and extending it back through the internal urethral orifice.

Urethral polyps are not uncommonly associated with chronic urethritis and trigonal cystitis. These little growths often surround the internal urethral orifice. They vary in size from a split pea to a good sized bean. They are easily seen with a cysto-urethroscope. They cause frequent urination when very large and numerous. They may produce obstruction and not infrequently may bleed.

They can be easily removed by the high frequency current applied through a cysto-urethroscope.

3. *Stricture of the urethra* in the female is about as frequent a sequel to the various infections and trauma as in the male. This is not commonly understood, because of failure to examine the female urethra. These strictures do not as a rule contract down to the point where they completely obstruct the outflow of urine as they may do in the male, but they are often the cause of persistent urinary symptoms such as frequency, pain on urination, and, when of small calibre, may cause some difficulty in the emptying of the bladder. Stricture is usually associated with a chronic urethritis and trigonal cystitis.

Stricture of the female urethra develops in the same way as stricture of the male urethra. There is first a destruction of the superficial epithelium by infection or trauma. This is followed by infiltration of urine with its chloride constituents, which have the property of producing connective tissue proliferation. This type of tissue tends to contract and to narrow the urethra and forms what we choose to call a stricture.

These patients suffer from frequency, urgency and pain due to the fact that the narrowed urethra causes a persistent urethritis with involvement of the mucous membrane of the trigone. The diagnosis can usually be made by introducing a bulb or acorn sound as in the male, and obtaining the hang as the sound is withdrawn, the narrow areas producing an obstruction to the passage of the shoulder of the bulb sound as it is withdrawn.

Having made the diagnosis the treatment is

both simple and satisfactory. Gradual dilatation with straight or Van Vuren sounds followed by instillation of mild solutions of silver nitrate such as one-quarter to one per cent solutions, results in the prompt relief of symptoms. As in the male, they may recur and, after complete dilatation, these patients should be dilated at long intervals until the possibility of recurrence is passed.

The relief of these patients by the early diagnosis and treatment of the stricture include a most grateful group because their suffering has usually been both severe and persistent.

4. *Elusive Ulcer of the Bladder.* These ulcers called by Hunner "elusive ulcer," but better described as "linear ulcer" are frequently the cause of severe and persistent urinary disturbances. They are due to a submucous infiltration or fibrosis which causes a thickening of the submucous tissues and stiffening of the bladder wall in the affected areas. These areas in time crack when the bladder is distended, producing the irregular jagged linear ulcer. On cystoscopic examination these lesions are difficult to see before they crack. There may be a localized area of redness and edema. On observing such an area while distending the bladder, one can frequently see an irregular crack or fissure develop on which small droplets of blood appear, which is quite similar to what we see when a chapped lip cracks. These patients suffer intensely from pain, urgency, and frequency and when the crack or fissure develops, blood is found in the urine. The urine is usually free from pus and is sterile. The ulcers often heal with scar formation. These bladders are small and contracted, holding but a small quantity of urine. The suffering of these patients is often out of all proportion to the appearance of the lesion.

*Treatment.* Bladder irrigations and the applications of chemicals have little influence on these ulcers. Resection including the entire bladder wall of the involved areas, transurethral fulguration, or diathermy applied through the supra-pubically opened bladder, and repeated dilatation of the bladder are helpful in some cases, while others are resistant or have a tendency to recur.

5. *Incontinence.* Incontinence of urine in the female is only too common, particularly that type in which the woman passes a small quantity of urine intermittently. In studying these cases one must rule out those which are due to an organic lesion of the nervous system, a spina bifida occulta, a vesico-vaginal fistula, a congenital defect in the anterior vaginal wall and bladder, hypospadias, and an ectopic ureteral opening. These can all be diagnosed by a careful inspection of the urethra and vagina, and a neurological study. The type of case which I wish to discuss is the patient who has a partial intermittent loss of urine. This is often exaggerated by any exertion, such as straining, running, coughing and sneezing. These cases are very common, in fact, I sometimes wonder if there are any middle aged women who are absolutely water tight.

These cases are all due to a disturbed or weak sphincteric action. The female is poorly supplied with sphincteric control as compared to the male, who practically has a double sphincter. Some women are evidently born with a weak sphincter, in others the circular muscle fibers which make up the sphincter of the bladder are injured, as a result of childbirth. Many of these women date their trouble to a delivery which may have been a normal or a difficult one. There is a lack of tonicity of the sphincter. Although it is not an uncommon belief that these cases are difficult to correct, many of them can be benefited or cured by a rather simple procedure, viz. a plication of the neck of the bladder. The torn or destroyed ends of the sphincter muscle are exposed by a longittudinal incision made in the anterior vaginal wall opposite the neck of the bladder. The injured ends are brought together with two or more catgut sutures placed one on top of the other, which practically plicates the neck of the bladder. This is done with a pezzar catheter in the bladder which is allowed to remain in place for ten days. The incision in the anterior vaginal wall is closed with catgut. This operation has been described by Young, Cabot, Kelly and others.

It will be seen from the brief description of the above conditions, that their diagnosis and treatment are quite simple. Still one sees many women who have suffered from disturbances of urination for long periods of time without relief. This is due in part to a lack of investiga-

tion of the exact cause of the disturbance. Many believe that these urinary disturbances are caused by inflammation of the bladder mucosa (cystitis), and that they may be relieved by bladder irrigations containing various chemicals. From the above it can be seen that few of these conditions have anything to do with the mucosa of the bladder and that little if any relief could be expected from treatment directed to the lining of this organ.

It will also be noted that many of the lesions causing these disturbances may be diagnosed and corrected by one who is not especially trained in urology.

A careful history of the case, together with an investigation of the contents of the pelvis, an examination of the external urinary meatus and testing the patency of the urethral canal will be rewarded by finding the etiology of many of the disturbances of urination in the female. When these examinations fail to reveal the cause of the trouble an expert urologic study with urethroscope, cystoscope, etc. becomes necessary.

## HEALTH EXAMINATIONS AT THE UNIVERSITY OF ILLINOIS*

VERGIL A. ROSS, M. D.,

CHAMPAIGN, ILL.

A complete physical examination is required of all students entering the University for the first time. The term "complete examination" is used here in a relative sense. For to utilize all available scientific resources for testing the quality of human tissue, the functional capacity of organs, the possible variations from the normal under varying conditions of stress would be impractical in our field of work. I consider an examination complete in a practical sense that fulfills the purpose for which it is intended.

The giving of these examinations starts at the end of the scholastic year in June and extends up to the time of registration in the fall. It is very important that this work be completed before the student registers so that findings are available in order to aid him in registration and progress in his school work. As some are below the Military requirement, consequently exempt from Military Science, others must be assigned to special classes in physical education, still others must have their activity both physical and scholastic limited, a few have to rearrange their whole schedule due to physical defects which would handicap them tremendously if they should follow out their desire to train themselves for a certain profession and last, for the correction of defects.

The majority of these examinations come in a brief period just before registration and consequently must be taken care of at that time. This means an immense amount of work to be done in a short period. Our staff is inadequate to handle the situation and we have called upon you from time to time to assist during this period. I want to take this opportunity to thank you for the hearty cooperation you have always given us. You are familiar with the methods we use at this time—each physician doing a certain portion of the examination. This segmental type of examination loses sight of the individual as an integral unit. It is a sort of impersonal affair. I think you will all agree with me that if one physician could do the complete examination of a particular individual; at the end summarize the history and physical findings giving to the student what advice is indicated, that this would be more ideal. But time and facilities do not permit this procedure. To compensate for this loss of personal contact. one or two physicians are placed at a point where they see all students after they have completed the examination. It is the duty of these physicians to review the history and physical findings and give to them what immediate advice is necessary.

Now that the student has made his first skirmish with the University and a record is obtained of his physical condition and medical history, you may ask what further relationship exists between the students and the physician of a University health station.

Webster defines "physician" as "a person skilled in the art of healing, and duly authorized to treat disease." The armamentarium of the physician of today is greater than this. In addition to his duty of treating disease, he has taken upon himself the task of detecting disease in its incipiency, guarding against disease tendencies and advising regarding personal hygiene. Again the same authority defines patient as "a sufferer; one who bears or endures; a sick person." It becomes apparent at once that the

*Read at meeting of Champaign County Medical Society, January 10, 1929.

patient of today does not always conform to this definition. Many times he demands of his physician that he be kept from playing the role of sufferer. It is with these more recent interpretations of "Physician" and "Patient" that we are concerned.

Now I may summarize the main object of a University health service. It is to improve the physical and mental health of students, aid in the stabilization of their emotional aspect of life, the prevention of disease, the education of the student body in regard to the essentials of healthful living and recommending the correction of physical defects. The examination records of these students are a valuable aid in carrying out these various functions.

Early in the first semester, following the completion of the entrance examinations, both the history and physical findings are rechecked by physicians. The purpose of this is to find those individuals that require further examinations and advice. Many conditions found at the time of examination, if interpreted without further examination, would lead to incorrect conclusions. I have previously stated that immediately following the examinations, the findings are summarized for the student, their significance explained and recommendations for their correction made. This statement should be qualified. Only that information is imparted to the student at this time in which correct deductions can be made as this advice is given at the time when the student is lost in the general maze of his new environment. So it becomes necessary to recheck and recall most of the individuals that have findings that deviate from the normal. As these cards are reexamined, various lists are made including the students' names and what reexaminations are to be made. The purpose of this is to have a record so that the reexamining physician will know what he is expected to reexamine without having to review the whole card and also for the purpose of telling when all this work is completed. These lists include heart, blood pressure, lungs, vision, teeth, thyroid, albuminurias, and various other conditions. Many of these cases require the taking of more history and a repeated number of consultations and examinations. A few require special examinations as x-ray, functional tests, basal metabolism, etc., wherever these are indicated, they are advised to have them done. Sometimes these follow up interviews are merely to be sure that the patient is following instructions. Frequently the reexamination gives the patient an opportunity to ask questions that he was not prepared to ask before.

There are other examinations given besides those at the time of entrance. A yearly complete examination is of unquestionable value. Our facilities do not permit us to follow out this routine among the large student body. We encourage them to have a yearly examination and take care of all those that request it.

Then there are the special physical examinations for students who participate in the strenuous type of athletics. These are to protect the student from attempting more than he is physically able to do and to safeguard the institution against an accusation of negligence in the discharge of the moral responsibility attendant upon the sponsoring of these activities.

Aside from the direct benefit derived by the student during his sojourn here at the University and in his future by these examinations, these records as they extend through the years give a certain amount of valuable information. For as you review the records you find among the abnormalities two types that are remediable. The one type that could have been prevented, had proper measures been taken earlier in life, but as found at stage of life when these examinations are given is past repair. The other type consists of those that are still remediable. And as these remediable and non-remediable, yet preventable defects, are found to be less through the years for this particular group, it will serve as an index of the advancement of preventive medicine.

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## A MODIFIED MURPHY PNEUMOTHORAX APPARATUS

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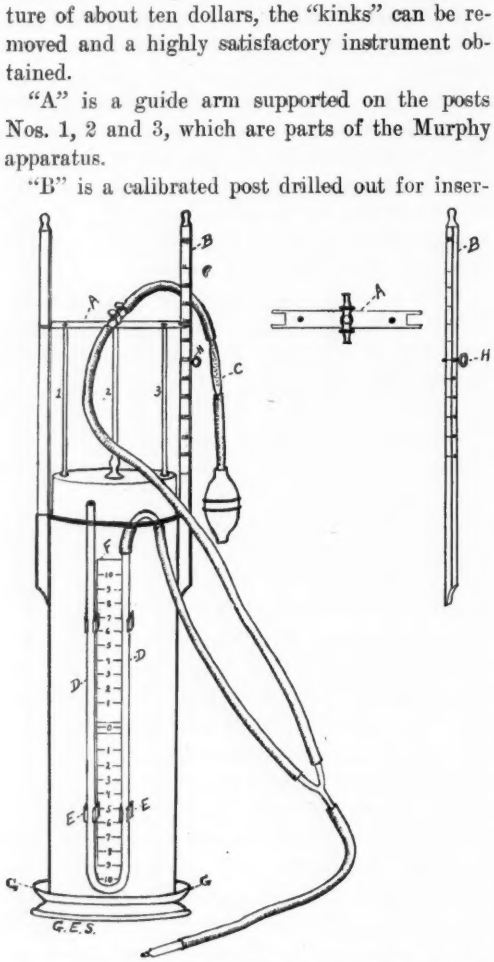
The accompanying sketch of a modified Murphy pneumothorax apparatus is made from an instrument that has been in the service of the writer for a number of years. The faults of the Murphy apparatus, as originally designed, soon become apparent to one who uses the instrument often and over a long period of time, albeit, it has at least three outstanding features which commend it—simplicity, compactness of

design, and lightness in weight. By engaging the services of a good mechanic, with an expenditure of about ten dollars, the "kinks" can be removed and a highly satisfactory instrument obtained.

"A" is a guide arm supported on the posts Nos. 1, 2 and 3, which are parts of the Murphy apparatus.

"B" is a calibrated post drilled out for insertion of removable pin "H" at calibrations from 500 c. c. to 1000 c. c.




"C" is a glass tube filled with loosely packed cotton which is moistened with a few drops of Lysol. This makes a satisfactory air filter.

"D" is the manometer, made of 3/16 inch glass tubing about 88 mm. long, bent over a fish-tail burner. Incidentally, the price of the usual water manometer is about five dollars, whereas the one herein described can be made for a few cents, without any sacrifice of accuracy.

"E," fuse clips (automobile) soldered to cylinder, permitting an easy removal of manometer.

"F," metal strip, 2 cm. in width, calibrated in centimeters and soldered to cylinder.

"G," splash cup.

"H," removable pin, to be placed in the drilled holes. This is necessary because from the 500 c. c. mark the cylinder descends with uncontrollable rapidity due to the diminished volume of air contained therein. It is obvious that the cylinder will not descend beyond the point at which the pin is inserted.

## "IDIOPATHIC" PERITONITIS*

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There has been considerable discussion in the literature about the justification of the use of the term "idiopathic" in connection with peritonitis. Melchior[1] has championed the term in relation to an acute serious type of peritonitis and cites over a dozen cases to prove his contention. He thinks this type is comparable to the hydrocele frequently seen in children. Such men as Duperthuis[2] and Michejda[3] disagree, believing there is always a focus, such as a strangulated viscus, pancreatitis, or retroperitoneal inflammation which produces the peritoneal reaction, and the fact that the patients may recover does not prove either the presence or the absence of bacterial infection. König[4] and Koch have also refused to admit the use of the word. There is no doubt but that most of the cases formerly included in this classification can be readily excluded by careful clinical and laboratory work. In other words, if the patient is operated upon for peritonitis and no primary focus is found, one is not justified in concluding that none is present without autopsy examination. On the other hand, there is still a small group of cases in which careful examination fails to reveal a primary source for the infection. Montgomery,[5] in 1925, reported under the title "Primary Pneumococcus Peritonitis" a case in which careful examination failed to reveal evidence of pneumonia or other extra-abdominal focus, and Leonardo,[6] in 1926, writing on "Primary Pneumococcus Peritonitis," cited four cases occurring in male infants in an effort to combat the more or less prevalent idea that the infection spread by way of the genitalia. Fishbein,[7] in reporting the results of 184 autopsies,

*From the Surgical Department, Rush Medical College of the University of Chicago, and the Presbyterian Hospital, Chicago.
*Read before the Section on Surgery, Illinois State Medical Society, Peoria, May 22, 1929.

found 39 cases of "primary" peritonitis. While almost all such cases can be classified according to the bacteriology found, the primary focus in some instances still remains unknown.

In reviewing a series of histories in the Presbyterian Hospital, I have found 22 cases recorded as idiopathic or primary peritonitis, or as peritonitis of unknown cause. To these, I wish to add one case from the Highland Park Hospital. An analysis of these cases immediately revealed the fact that ten were merely lacking in data for a complete diagnosis. For example, Mr. J. L. Mc. (163680) was operated upon by Dr. Bevan with the preoperative diagnosis of appendicitis. A diffuse peritonitis was found without involvement of the appendix or gall-bladder. Careful exploration failed to reveal any other tangible primary focus. The patient died and no autopsy was obtainable. Although the entire bowel was examined, is it not possible that a retroperitoneal infection, or even pancreatitis without the usual fat necrosis was overlooked? Another example was Mr. J. R. (95018) operated upon by Dr. Phemister. This patient, a man aged 61, entered the hospital with marked abdominal distension, acute pain and generalized tenderness. At operation diffuse seropurulent peritonitis was found, most marked in the pelvis. Examination of appendix, sigmoid and bladder was negative. The patient was drained and went on to a prompt recovery. Might he not have had pancreatitis, or an undiscovered inflamed diverticulum, or even a perforated ulcer which had spontaneously closed? Obviously, we are not justified in calling such cases idiopathic or primary.

In a second group (Series II), comprising ten cases, we find on closer examination of the history, a presumptive focus in some remote part of the body. For example, V. S. (169656), a female child, four months old, died with general peritonitis. Staphylococcus was found at autopsy, both in the peritoneal cavity, in furuncles about the head and from a furuncle of the abominal wall. This case almost certainly belongs to the group which should be diagnosed as hematogenous peritonitis from a known primary focus although lymphatic extension through the abdominal wall must be considered as a remote possibility. Such an example, also, is the case of E. J. (222764). This patient, a girl, aged 9, entered the hospital on the service of Dr. Parmelee, March 30, 1928. She complained of pain in abdomen, diarrhea, and headache. Her history dated back nine days when her sole complaint was a headache. The following day her temperature rose to 102° F. and on the third day it had reached 105° F. On the fourth day, the child's throat was reported to have been distinctly reddened and her temperature was 106° F. Two days later, she had a severe chill, followed by abdominal pains and diarrhea. Dullness developed on the right side of the chest and on April 2, a bloody fluid was obtained by thoracentesis. Culture of this fluid revealed the hemolytic streptococcus. The patient's condition grew worse. Though definite signs of peritonitis developed exploration did not seem at any time to be warranted. Death occurred April 8, and autopsy revealed acute generalized fibrinopurulent peritonitis; bilateral pleuritis; right empyema, but no gross pathology in the throat. Streptococcus hemolyticus in pure culture was obtained from the peritoneal and pleural fluids.

Without a careful history, the primary cause of this child's peritonitis would never have been discovered, but under the circumstances, there is no doubt but that it should have been included under the hematogenous group with the throat as the primary source.

Finally, we have left but three cases. (Series III.) The first, a baby girl, B. S. (117605), four weeks old, was brought to the clinic on account of swelling of the abdomen and continual crying. The onset was somewhat gradual, but the child had been vomiting for three days. Except for distention of the abdomen and fluid in the flanks, the physical examination was negative. I operated upon the child and removed about 500 c. c. of an opalescent turbid fluid from which the streptococcus was grown in pure culture. The child died four days later and no evidence of a primary focus could be found.

The second case, C. G., a boy of nine years, was referred to me by Dr. M. D. McNeal of Highland Park. According to the history, he had not felt quite well for some time, but had been doing all ordinary things. On September 22, 1927, he had some fever for which no cause could be found. The following day he was quite well and went to school. On Septem-

ber 24, his temperature went to 103° F., and Dr. Penny, of Libertyville, thought the child had peritonitis. A few hours later, there was no rigidity and the boy seemed better. On September 26, when I saw him for the first time, the patient presented the picture of general peritonitis, with temperature 104.6° F. and leucocytes, 41,000. There had been nothing to suggest a primary focus. Immediate exploration by midline incision revealed generalized serofibrinous peritonitis. Cultures showed streptococcus hemolyticus. The child died September 28, and autopsy was performed by Dr. C. W. Apfelbach. His chief findings were: "Acute serofibrinous generalized peritonitis; recent laparotomy wound; marked hypostatic hyperemia and edema of the lungs; hyperplasia of the solitary lymph follicles of the small bowel and Peyer's patches; and dilatation of the stomach and bowel."

In reviewing the possible source for this infection, it was learned that the boy had been given Dick's serum, about September 1, because two or three mild cases of scarlet fever had developed in his camp. At no time was there any evidence that he had scarlet fever.

The third case, a female colored child, A. J. (183630), 2 years old, entered the hospital on the service of Dr. Grulee. She had been ill for two to three weeks, beginning with fever, convulsions and delirium. Distension of the abdomen was noted soon after onset. Belching was constant, but no vomiting until two days before admission. There was no history of cough or of severe pain. Leucocyte count, 18,000. The child died the following day and autopsy showed what appeared to be primary pneumococcus peritonitis.

It will be seen that these last three cases bear a striking resemblance to those of the second group in which there occurred a definite primary focus elsewhere that had been overlooked. Where careful examination still leaves us at a loss to explain the primary source of the peritonitis, it seems to me that the term "cryptogenetic" used by Leube, is much more appropriate than such terms as primary or idiopathic.

*Discussion:* In analyzing thirteen cases of supposed primary or so-called idiopathic peritonitis, it has been found that most of them are hematogenous in origin. While it is possible that one or two may be the result of lymph stream invasions or direct extensions from old walled-off foci, such as infected retroperitoneal lymph nodes, definite proof is lacking. Jensen and others have suggested the possibility of invasion by way of the gastro-intestinal tract, but the feeding of pneumococci to young rabbits has given uniformly negative results. Nine of these cases were streptococcus infections, one staphylococcus aureus and one pneumococcus. In two the organism is not stated. It has been repeatedly pointed out that primary pneumococcus peritonitis occurs only in children, and this would seem to be borne out in the case of the streptococcus as well. It has been assumed that blood borne infections occur much more readily in children, but the development of immunity is probably responsible for the extreme rarity of this disease in older individuals.

The symptoms in all cases were those of acute peritonitis with high fever, marked leucocytosis —18,000 to 41,000—and usually marked prostration. To differentiate the picture from that of apprendicitis is difficult and sometimes impossible. It is striking, however, that appendicitis was not the working diagnosis in the majority of these cases. While the mortality in the thirteen cases is 100%, patients making a recovery have been placed in the first group. Nevertheless, the mortality in acute pneumococcus peritonitis varies according to Lipschutz and Lowenburg[8] from 85% to 90%, and streptococcus peritonitis must have close to 100% mortality.

I have nothing to add in the way of treatment, except to call attention to the frequency of nose and throat infections as the primary focus. While operation has little to offer in this type of peritonitis, where doubt exists as to the presence of an acutely inflamed appendix or other abdominal focus, the patient should be given the benefit of the doubt.

*Conclusions:* 1. Thirteen cases of so-called "idiopathic" peritonitis have been studied. Most of them are streptococcus or pneumococcus infections of hematogenous origin.

2. Careful history taking combined with careful autopsy findings should completely eliminate the use of such terms as primary and idiopathic as applied to peritonitis.

3. In the rare instances in which accurate

laboratory methods fail to reveal the primary source of peritonitis, the term *cryptogenetic* is suggested.

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## DISCUSSION

Dr. E. P. Coleman, Canton: In the spring of 1912 when I was a junior medical student there was an epidemic of sore throat in Chicago. We were informed by some of our faculty men that a large number of these cases had developed symptoms of peritonitis following acute tonsillitis. It was a milk-borne infection, rather general over the city. I remember it very well because I first got it and brought it back to our fraternity house, while doing maternity work. The term used was septic

### SERIES II

| *Name* | *Hosp. No.* | *Attending Physician* | *Sex* | *Age* | *Outcome* | *Diagnosis* | *Organism Found* | *Notes* |
|---|---|---|---|---|---|---|---|---|
| M.B. | 190030 | Parmalee Oberhelman | F. | 45 d. | Died | Acute pyogenic peritonitis | Not cultured | w.b.c. 35,900 sup. arthritis of right hip |
| F.B. | 159896 | Winholt | F. | 49 d. | " | Acute serofibrinous peritonitis | Strep. | w.b.c. 24,200 lymph gland hyperplasia |
| V.S. | 169656 | Gardner | F. | 4 mo. | " | Serofibrinous peritonitis | Staph. aureus | w.b.c. 43,700 furunculosis of neck and abdomen |
| N.B. | 101711 | Herrick | F. | 13 yrs. | " | Peritonitis pleuritis pyemia | Not cultured | w.b.c. 29,000 pericarditis evident before death |
| E.A. | 177131 | Grulee | M. | 2½ yrs. | " | Acute serofibrinous peritonitis Gen. icterus Acute anemia | Strep. hemolyt. | w.b.c. 31,000 sore throat 7 days before death |
| H.A. | 96887 | Bassoe | M. | 1 yr. | " | Purulent peritonitis | Strep. hemolyt. | w.b.c. 33,800 bilateral acute pleuritis. Laryngitis |
| M.T. | 202754 | Grulee | F. | 7½ mo | " | Generalized peritonitis | Strep. hemolyt. | w.b.c. 19,300 Acute throat infection. Some vulval irritation |
| J.B. | 211899 | Hoffman Straus | F. | 6 yrs. | " | Acute peritonitis Maxillary sinusitis Pyemia (?) | Coccus in chains. No cultures | w.b.c. 16,800 Sinus drained 10 days before peritonitis developed |
| C.N. | 214149 | Grulee Gatewood | F. | 11 mo. | " | Generalized peritonitis | Strep. hemolyt. | w.b.c. 29,000 Vaginitis and probable arthritis |
| E.J. | 222764 | Parmalee | F. | 9 yrs. | " | Fibrino-purulent peritonitis Bilateral pleuritis Empyema (R.) | Strep. hemolyt. | w.b.c. 23,000 Red throat 2 days before onset of peritonitis |

### SERIES III

| *Name* | *Hosp. No.* | *Attending Physician* | *Sex* | *Age* | *Outcome* | *Diagnosis* | *Organism Found* | *Notes* |
|---|---|---|---|---|---|---|---|---|
| B.S. | 117605 | Hoffman Gatewood | F. | 28 d. | Died | Serofibrinous peritonitis | Strep. | No primary focus discoverable |
| C.G. | H. P. Hosp. | McNeal Gatewood | M. | 9 yrs | " | Acute serofibrinous peritonitis | Strep. hemolyt. | w.b.c. 41,000 Exposed to scarlet fever 3 weeks previously |
| A.J. | 183630 | Grulee | F. | 2yrs. | " | Purulent peritonitis Bilateral pleurisy | Pneumococcus | w.b.c. 18,000 No primary focus discoverable. |

peritonitis. A number of cases were operated on. An inflamed peritoneum was found, but the appendix was normal. Since graduation my experience in primary peritonitis or idiopathic peritonitis is limited. There will be an occasional case in young children. Symptoms of appendicitis will be present and at operation a moderately inflamed peritoneum will be found, a normal appendix removed and the patient recover. That may be a hemolytic infection. I have two cases proved by autopsy, both in young women in the early twenties; both were brought in with general peritonitis; both were opened and a considerable amount of pus found. At autopsy in neither case was there a perforation or evidence of any pelvic trouble or any other focus of infection. I believe those were hemolytic infections. The pus was pneumococcus in type on culture. I think these were cases of primary peritonitis. I mention this possibility; some cases that were thought to be appendicitis and were called appendicitis because one or two rather large vessels were found near the appendix which ease the conscience of the operator, but some of these cases may be secondary to hemolytic infection with a very low grade peritonitis which is not fatal.

Dr. Bransford Lewis, St. Louis, Mo.: I want to say in the first place that I do not know anything about this condition from my personal experience but just what I have derived from my work in the St. Louis City Hospital many years ago in which the mortality rate quite compared with that reported in Dr. Gatewood's paper, his own mortality in that group being 100 per cent. and an admitted mortality of 95 to 98 per cent. I became acquainted with the work of Dr. Chrysler of Memphis. I was invited by Dr. Chrysler to go duck hunting and just as we were about to go out in the early morning a patient came in from Missouri with a pulse of 140 and the abdomen blown up from appendicitis of five days' standing. Dr. Chrysler opened him up right away and used his iodin method of treatment. My own observation was that he was wasting his time and that the man would be dead before he would get back. He said, "Dr. Lewis, the man will get well." I told him I had seen quite a number of such cases and they all died. Still he was convinced that the patient was going to get well. We went on our hunt and came back five days later and the patient was sitting up in bed calling for grub; he got well.

Dr. Chrysler told me that he had had 85 to 90 per cent mortality but by the use of the iodin treatment which he and Dr. Johnson had instituted, they had reduced the mortality to 5 per cent. The success of their method was verified in this one case, at least. The method consists in putting 2 per cent iodin solution into the infected abdominal cavity and working it among the intestines. After taking out maybe a quart of pus, sluicing the iodin solution into the abdominal cavity and wiping it out, putting in another pitcherful and wiping it out. The method and results have been reported to the Southern Surgical Society. If I were doing general surgery I would make use of it.

Dr. Gatewood, Chicago (closing the discussion): This is obviously a big subject and it is too late to discuss it in detail. I thought someone would say more about pneumococcic peritonitis. It is divided into two groups. The mortality in the acute type is what I have given; the mortality in the chronic type is very much less. In pneumococcus peritonitis some of the patients have a direct extension through the diaphragm and a localized peritonitis, while other have general peritonitis. Most of the patients in my series are of the streptococcic type and the mortality must be close to 100 per cent. In selecting this group I took autopsy cases and naturally my mortality was 100 per cent. In patients where I could find a definite etiologic factor, the results were slightly better.

In regard to Dr. Lewis' suggestion, I have not very much to say because I have not tried it. There is considerable to be said for thorough irrigation of acute peritonitis of any type. Murphy showed that long ago. On the other hand, it has been the experience of most of us that the less one did in the way of irrigating and destroying the protecting exudate, the better off the patient was. I feel, with Dr. Harger, that these patients should be explored early and what fluid can be removed, removed. It has been shown by many people that experimentally the stomach kills off streptococci very rapidly and that streptococci cannot be obtained from the fasting stomach; in fact, very few pathologic organisms will live in the stomach for a long period of time. Indeed, were this not the case those of us who do surgery of the stomach would have many cases of peritonitis.

## A CLINICAL REPORT OF NINETEEN CASES OF FRACTURED TRANSVERSE PROCESSES PRODUCING SYMPTOMS SIMULATING THOSE REFERABLE TO THE KIDNEYS*

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At the meeting of this section last year, we had several papers which discussed the symptomless spine, including many anomalies and variations of greater and less magnitude. At this time, I will try to briefly discuss the clinical aspect of a spinal injury, which in 19 cases out of 26 coming under my observation, gave symptoms clearly simulating those referable to the kidneys on the injured side.

I have no apologies to make for presenting this brief resumé of the clinical, roentgen and

*Read before the Section on Radiology, Illinois State Medical Society, May 22, 1929.

pathological findings in this series, except that possibly the reporting of them is rather late and long delayed. As it is, they would probably not have been reported at this time, had I not recently come upon a case that was almost identical with the first one I saw, which was some 15 years ago.

Fractures of the transverse processes of the lumbar vertebrae are not rare, but a series of 19 cases which gave symptoms referable to the kidneys, none of which showed shadows which might be diagnosed as kidney stones, seems to me to be of sufficient interest to present at this time.

All these cases except six were in men, and all except three presented a definite history of severe trauma to the lumbar region, from three to twenty-five years before. The three exceptions were recently injured. Five of the nineteen cases were operated on and had the broken and deformed transverse processes removed, all of which resulted in prompt and complete relief from the symptoms complained of, and referable to the kidneys.

I will not go into the history of these cases except in a fragmentary manner, but will recite something of the first case, more particularly.

Case 1 was a well known Chicago physician, who while a boy living on a farm had been thrown from a horse, and landed upon the top of a fence post on his left flank. For something like a dozen years he had been complaining of symptoms referable to his left renal region.

After I had examined him and reported negative renal findings, but with the presence of a fractured first left lumbar transverse process, he and his surgical confrere demurred upon accepting so bizarre a cause for his trouble. He was then most carefully examined by three of the most prominent Chicago

TABULATION OF 19 CASE RECORDS OF FRACTURED TRANSVERSE PROCESSES, PRODUCING SYMPTOMS REFERABLE TO THE KIDNEYS

| *Case No.* | *Sex* | *Age* | *Duration of Symptoms* | *Clinical Diagnosis* | *Roentgen Findings* | *Operated* | *Remarks* |
|---|---|---|---|---|---|---|---|
| 1. | M | 43 | 12 years | L. renal stone | Fract. L. 1st Lumb tv. process. | Yes. | Prompt and complete relief. |
| 2. | M | 36 | 2 years | R. renal stone | Fract. R. 1st Lumb tv. process. | | |
| 3. | M | 45 | 16 years | R. renal stone | Fract. R. 1st Lumb tv. process. | Yes. | Prompt and complete relief. |
| 4. | M | 17 | Recent | R. renal symptoms after injury | Fract. R. 1st Lumb tv. process. | Yes. | Prompt and complete relief. |
| 5. | M | 36 | 7 years | L. renal stone | Fract. L. 1st Lumb tv. process. | | |
| 6. | M | 28 | 11 years | R. renal stone | Fract. R. 1st Lumb tv. process. | | |
| 7. | M | 59 | Recent | Injury with L. renal symptoms | Fract. 1 and 2 L. Lumb. tv. processes. | Yes. | Prompt and complete relief. |
| 8. | M | 36 | 8 years | L. renal stone | Fract. R. 1st Lumb. tv. process. | | |
| 9. | M | 41 | 10 years | R. renal stone | Fract. R. 1st Lumb. tv. process. | | |
| 10. | F | 36 | 12 years | R. renal stone | Fract. R. 1st Lumb. tv. process. | | |
| 11. | M | 46 | 15 years | R. renal stone | Fract. 1st Lumb. tv. process (R). | | |
| 12. | M | 40 | 5 years | L. renal stone | Fract. L. 1st Lumb. tv. process. | | |
| 13. | F | 26 | 3 years | L. renal stone | Fract. L. 1st Lumb. tv. process. | | |
| 14. | M | 45 | 12 years | R. renal stone | Fract. R. 1 and 2 Lumb. tv. processes. | Yes. | Prompt and complete relief. |
| 15. | F | 26 | 2 years | R. renal stone | Fract. R. 1st Lumb. tv. process. | | |
| 16. | F | 32 | 6 years | R. renal stone | Fract. R 1st Lumb. tv. process. | | |
| 17. | F | 33 | 7 years | L. renal stone | Fract. L. 1st Lumb. tv. process. | | |
| 18. | F | 25 | 6 years | R. renal stone | Fract. R. 1st Lumb. tv. process. | | |
| 19. | M | 50 | Recent | L. renal symptoms following injury | Fract. L. 3, 4 and 5 L. Lumb. tv. processes. | | Struck by front mudguard of model T Ford. |

surgeons, two leading internists and one leading roentgenologist, none of whom would agree with my diagnosis. Later a roentgenological confrere, to whom I referred the patient, agreed with my findings, and in sheer desperation, the patient decided to submit himself to operation, and had the fragment—a malunited transverse process—removed. During the operation, while viewing the field of operation, after the bone had been taken out, we saw, lying *immediately* beneath the distal extremity of this piece of bone, a small nerve, which had its sheath decidedly and definitely reddened—where the tip had been causing pressure, and it was assumed, from the subsequent history of the case, that this pressure on the nerve had caused the pain complained of, and which did not recur after the operation.

The history of the other four cases operated on is almost identical, as regards the results following removal of the fractured bone; but in these cases my diagnosis was immediately accepted, without cavil. The results following all these operations were ideal.

The operation for removal of these bone fragments is a difficult one, as the surgeon has to burrow down deep, and separate heavy muscles, and after reaching the offending structure, he must remove it along with its periosteum, so that it will not grow again; but as before stated, the effort is well worth while.

The following table will give such particulars as may be of interest and value.

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## SANITARY CONDITION OF THE ILLINOIS RIVER*

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CHICAGO

Many investigations have been made concerning the pollution of the Illinois River. There is probably no stream in the United States that has been so thoroughly studied from a chemical and bacteriological standpoint. Long before the opening of the Drainage Canal the river was seriously polluted by sewage from Chicago and other cities along its banks. These investigations started almost sixty years ago under the direction of E. S. Cheseborough. Twenty years later further studies were made by Dr. John H. Rauch and Professor J. H. Long. In 1894 the Chicago Health Department carried on studies under the direction of Dr. Adolph Gehrmann. In the year preceding the opening of the Drainage Canal very extensive studies were undertaken and these were continued throughout 1900 following the opening of the Canal. These investigations were made under several authorities including Dr. Arthur R. Reynolds, Commissioner of Health of Chicago, Edwin O. Jordan, University of Chicago, Dr. Arthur W. Palmer and T. J. Burill of the University of Illinois. A fourth collaborator was Mr. Holman, Water Commissioner of St. Louis, who arranged to have duplicate analyses made at Washington University. These very extensive investigations formed the scientific basis of the data presented in the famous Illinois-Missouri suit concerning the opening of the Drainage Canal.

Occasional analyses were made by the Sanitary District after the opening of the Canal, particularly after 1910. Between 1910 and 1919 occasional trips were made down the Illinois River by chemists of the Sanitary District. In 1919-21 more extensive studies were made, extending over several months, during the summer season. The need for more data prompted the Sanitary District to request a more extensive investigation by the United States Public Health Service. Through the cooperation of the Surgeon General the necessary arrangements were made and a thorough investigation was made under his direction, with the help of the Sanitary District, from August, 1921, through August, 1922. The results of these studies furnished the most comprehensive basis for detailed estimates of the amount of diluting water required for future conditions. Some results of this investigation will be discussed later.

One difficulty was found in interpreting the results of this survey on account of the fact that only a single sample was taken each day. The discharge and composition of the river water was found to vary materially throughout the 24 hours in the upper part of the river. An attempt was made to correct the single analyses so that they would express the daily average result, but the correction factors were based on rather limited data extending over 24 hours.

In order to obtain completely authoritative data the Sanitary District started the most comprehensive investigation to date in 1925. This is still in progress. In 1928 approximately sixteen stations were included, extending from Chi-

*Read before the Section on Public Health and Hygiene, Illinois State Medical Society, Peoria, May 22, 1929.

cago to Grafton. At most of these stations there were three samplers who collected hourly samples, which were analyzed in six field laboratories located at Joliet, Marseilles, Chillicothe, Peoria, Pekin and Beardstown. Assistant chemists were stationed at these laboratories, where samples were analyzed and data summarized. These data will be discussed later.

In addition to the work mentioned above, long continued studies have been made by the State Natural History Survey under Stephen A. Forbes, Chief. Mr. Robert E. Richardson has personally conducted most of these studies and he probably has a more intimate knowledge of the sanitary condition of the Illinois River than any other man. These studies have referred mainly to fish life in the Illinois River.

In addition to these investigations occasional studies have been made by the Illinois State Water Survey, some of which were in collaboration with the Natural History Survey.

*Use of Illinois River.* The Illinois River has not been used as a source of water supply within the last fifty years. Most of the towns located along its banks have been able to obtain drinking water from deep wells. The 1899-1900 surveys had some reference to water supply in that the Illinois-Missouri suit was concerned with the possibility of the pollution of the St. Louis water supply by pathogenic organisms from Chicago. The bulk of the testimony proved that this danger was negligible. Since then the investigations have been mostly concerned with a study of nuisance conditions, with accompanying disappearance of fish life, odors from sludge and deoxygenation of water, and destruction of pleasure boating and passenger traffic. These factors are now probably the only ones of importance, as there is no thought that the Illinois River will be used for water supply even in the remote future. The conditions of nuisance will be of great importance when the deep waterway is completed. Passenger traffic will require a waterway free from odor, clear, and of attractive appearance.

Conditions for the past ten years in mid-summer have not changed appreciably, since the amount of diversion at Chicago has increased slightly and a certain amount of reduction in polluting matter has been accomplished. Each summer the conditions in the upper river are very bad, particularly above the Marseilles Dam. There is very little improvement until Peoria Lake is reached, but a remarkable self purification occurs throughout this stretch. The river immediately below Peoria does not show the full effect of the Peoria pollution, but at Pekin, Havana, and Beardstown the river is unable to recover and the dissolved oxygen remains considerably below saturation. In fact there is only 4.0 p.p.m. dissolved oxygen at Grafton in mid-summer, equivalent to 50 per cent saturation.

Although mid-summer conditions of pollution are usually most serious, at times the river freezes over in severe winters and the absence of reaeration results in dissolved oxygen values which almost approach zero. Such a winter occurred in 1917-18. Under such conditions the killing of fish is more extensive than during hot weather because the fish are unable to reach oxygenated water. From a general standpoint the nuisance from odors is not appreciable in winter.

Spring floods are of benefit in diluting the polluting matter, but they carry sludge deposits farther down stream, where they are deposited and effect a deterioration in summer. The river is usually in worst condition when we have very warm weather in June with low flow of tributaries. Under these conditions the sludge deposits in the upper river decompose almost explosively, resulting in the discharge of large masses of floating sludge, which are carried down the river to Chillicothe and beyond. In our studies, however, there has been no season in which the river was unable to recover markedly during passage through the Peoria lakes. At Chillicothe dissolved oxygen may frequently average 1 p.p.m. or less but at Averyville the average is usually from 4 to 6 p.p.m. The shallow water and the abundance of green growths accomplish remarkable self-purification of the river water. These lakes have served as excellent barriers against the progressing pollution for a good many years. As the sewage load of Chicago is reduced the first improvement will be noted in this part of the river.

*Oxygen and Bacteria.* Dissolved oxygen results for a typical recent year are given in Table I for August, 1926. The results indicate that there is practically no oxygen present above Marseilles and only 1 p.p.m., or slightly more, down to

Chillicothe. At Averyville and Wesley a little over 6 p.p.m. was found but this decreased to 3 p.p.m. at Beardstown.

TABLE I—ILLINOIS RIVER

Dissolved Oxygen, August, 1926, Sanitary District of Chicago

| Station | Temp °C | Dissolved Oxygen: Parts per Million | Dissolved Oxygen: Per Cent Saturation |
|---|---|---|---|
| Lockport | 23.0 | 0.1 | 1 |
| Brandon's Bridge | 23.0 | 0.7 | 8 |
| Morris | 23.5 | 0.4 | 5 |
| Marseilles | | | |
| above dam | 24.7 | 0.8 | 9 |
| below dam | 24.7 | 4.1 | 48 |
| Peru | 24.4 | 1.7 | 20 |
| Henry | 24.1 | 1.2 | 14 |
| Chillicothe | 25.5 | 1.4 | 17 |
| Averyville | 24.5 | 6.0 | 70 |
| Wesley City | 25.2 | 6.4 | 77 |
| Pekin | 25.8 | 4.5 | 54 |
| Beardstown | 24.9 | 3.0 | 36 |
| Pearl | 25.8 | 3.5 | 42 |

Bacteriological analyses were made by the United States Public Health Service in 1921-22. Their results are shown in Table II for September, 1921. These results show a very sharp decline in bacterial count in the upper part of the river, with a slower rate of decrease from La Salle to Chillicothe. Just below Peoria there is a tremendous increase with a following decrease, although the count far down stream at Kampsville is still greater than at Averyville. The rate of decrease of B. coli was apparently as great as that of the saprophytic organisms.

In winter the rate of decline was very much less than in summer and all counts at all points were well below the summer averages. From their results the Public Health Service has calculated the total number of B. coli contributed per capita to the Illinois River. They found that each day one individual contributed 230 billion B. coli on the yearly average, varying from 42 billion in winter to 430 billion in summer. These figures refer to the river below Lockport. At Peoria the average was somewhat less and the variation between summer and winter was not so great. Many other interesting conclusions were drawn from the bacterial results with reference to the death rates and the effects of dilution and sedimentation. These results show further that in summer within 2.0 hours time of flow below Lockport 50 per cent. of the original bacteria had been eliminated and that in 86 hours 99 per cent of the B. Coli were destroyed. These results add further confirmation to the previously held theories with regard to the rapidity of self-purification of polluted streams. The survival of pathogenic organisms for longer periods than 100 hours would be quite surprising under such antagonistic conditions as are found in highly polluted streams like the upper Illinois. It is quite probable that danger from pathogenic organisms disappears quite some time before conditions of nuisance are alleviated.

TABLE II—ILLINOIS RIVER

Bacteria and B. Coli, U. S. Public Health Service

| Station | September, 1921 Per Cubic Centimeter: Gelatin 20°C. | Agar 37°C. | B. Coli | Summer Season Corrected for dilution and additional downstream pollution: Hours from Lockport | Per Ct. of Original Count: Gelatin | Agar | B. Coli. |
|---|---|---|---|---|---|---|---|
| Lockport | 3,420,000 | 4,390,000 | 39,600 | 0 | 100.0 | 100.0 | 100.0 |
| Joliet | 2,520,000 | 2,900,000 | 49,500 | 1.3 | 66.6 | 62.7 | 76.8 |
| Brandon's Bridge | 2,030,000 | 2,370,000 | 31,500 | 2.0 | 47.6 | 50.9 | 47.2 |
| Morris | ..... | 2,270,000 | 31,600 | 14.3 | 37.5 | 38.1 | 38.3 |
| Marseilles above dam | ..... | ..... | ..... | 27.0 | 26.1 | 24.5 | 19.8 |
| Ottawa | 290,000 | 352,000 | 3,970 | 31.8 | 17.5 | 14.4 | 15.8 |
| LaSalle | 67,300 | 73,800 | 1,470 | 41.1 | 4.1 | 3.0 | 5.6 |
| Henry | 21,700 | 22,800 | 152 | 85.8 | 2.1 | 1.7 | 0.6 |
| Averyville | 3,310 | 2,830 | 13 | 185.0 | 0.15 | 0.08 | 0.03 |
| Pekin | 47,000 | 50,300 | 310 | .... | .... | .... | .... |
| Havana | 98,800 | 89,300 | 898 | .... | .... | .... | .... |
| Browning | 22,300 | 26,000 | 252 | .... | .... | .... | .... |
| Beardstown | 24,700 | 25,800 | 220 | .... | .... | .... | .... |
| LaGrange | 23,400 | 21,100 | 187 | .... | .... | .... | .... |
| Pearl | 25,300 | 15,600 | 314 | .... | .... | .... | .... |
| Kampsville | 20,000 | 10,600 | 111 | .... | .... | .... | .... |

*Sewage and Industrial Wastes.* The major sources of pollution in the Illinois River are human sewage and organic industrial wastes. Thor-

ough studies have been made by the Sanitary District of the various industrial wastes in Chicago. Briefly, these are the stock yards, Corn Products, and tannery wastes. The total effect of these three wastes is equivalent to approximately 40 per cent. of the human population. Within the last few years a remarkable reduction has been made in polluting matter discharged in Corn Products wastes at Argo. By cooperative work the population equivalent of these wastes has been reduced from more than 400,000 down to 55,000. This load has been taken off the upper Illinois River. The opening last fall of the North Side Treatment Works at Chicago is also an important factor in relieving the pollution load. At present, on account of the financial stringency, we are operating this plant at only one-third of its capacity. With increased funds it will be possible to operate it at full capacity, which is 175 million gallons per day. This will treat sewage of a population of 800,000.

The West Side Works Imhoff tank plant can be completed as soon as funds are available. The greater part of two units out of three comprising this plant is almost finished, consequently within the next one and one-half years it should be possible to treat the sewage from a population of more than one million. The net effect of these two large treatment works and the reduction of Corn Products pollution should result in very appreciable improvement in the condition of the river from Peoria up to Starved Rock. The upper river will not show as marked improvement. The deep waterway pools will not be in satisfactory condition until all settleable solids are removed from the sewage and the residual organic matter is oxidized. When this is accomplished, and assuming that nearly the same amount of diversion will be permitted as under the present permit, namely 8,500 c.f.s., the river above Peoria should be in very satisfactory condition. If the diversion is reduced to the negligible amount mentioned in the Supreme Court decision it is quite doubtful whether satisfactory conditions will obtain in the upper River.

The possibility that a drastic reduction might be enforced is of serious concern to Peoria and other towns below Peoria. Remarkable progress is being made toward the solution of Peoria's treatment problem but this problem is so difficult on account of the enormous effect of industrial wastes that a satisfactory outcome will depend to a considerable degree upon the amount of dilution available in the river. The most recent figures for Peoria industrial wastes based upon recent surveys and analyses made in our Peoria laboratory indicate that the industrial wastes of Peoria may be equivalent to 1,100,000 population. Comparisons of the Peoria industrial load with reference to the human population and some data for several other cities are given in Table III. These figures indicate that Peoria has the heaviest burden of industrial pollution of any of the six cities listed. It is probable that the Commercial Solvents wastes may have the highest population equivalent of any single plant in the United States. There is reason to hope that large reductions may be made in the concentration of these wastes by recovery processes similar to those that have been installed by the Corn Products Company. Such recoveries are certainly advisable if research indicates that they are feasible.

TABLE III

Populations and Industrial Wastes

| City | Human Population | Industrial Waste Population Equivalent | Per Cent Decrease |
|---|---|---|---|
| Chicago (San. Dist.) | 3,560,000 | 1,410,000 | 40 |
| Milwaukee ..... | 600,000 | 300,000 | 50 |
| Indianapolis ..... | 351,000 | 290,000 | 83 |
| Ft. Worth ..... | 160,000 | 160,000 | 100 |
| Decatur ..... | 40,000 | 300,000 (1926) | 750 |
| Peoria ..... | 90,000 | 1,100,000 | 1,200 |

For the future the degree of treatment of the Peoria sewage and wastes will be governed, to a large extent, by the amount of dilution available in the Illinois River in mid-summer. For this reason Peoria should be interested in the question of diversion of lake water as well as Chicago. Sanitary conditions of the Illinois River demand that a reasonable degree of clearness and purity obtain after all possible measures have been taken to treat sewage and industrial wastes. These standards can be met only by continued diversion of lake water from Lake Michigan.

# SURGICAL DIATHERMY IN CARCINOMAS ABOUT THE HEAD*

T. C. GALLOWAY, M. D.

EVANSTON, ILL.

In spite of all our efforts cancer still comes late to its proper treatment. Ignorance, procrastination, dread, and the false promise of inadequate and ineffectual treatment lead to fatal delay.

What should constitute proper treatment of cancer about the head has been much debated, and varies with the type, location and duration. Early, there is little question with any method, and the results are relatively certain with excision, radiation or diathermy.

The cases dealt with here are mostly of that class previously considered hopeless. For that reason we can present no imposing statistics but our experience with such patients has given us a very real enthusiasm for diathermy. Their lot is horrible, and anything that offers them hope should be repeatedly discussed. That is the reason for the presentation of what is probably common knowledge though advantage has not been fully taken of the relief that may be obtained in such cases by surgical diathermy.

Because the terrible cases that were crowding our ward and demanding some help, were mostly inoperable we seized upon diathermy for them as a last resort. The results, however, were so satisfactory that we began to use it more and more for simpler cases, and have finally come to believe that for carcinomas about the head it is the best means of treatment, with a very few exceptions.

These exceptions include small and doubtful lesions of the lip which can be treated with perhaps the best cosmetic results by excision; small basal cell carcinomas of the skin that are safely handled by excision or radium; small lesions about the eye that can be cured by radium with perhaps the least injury. Although the first results in treatment of two intrinsic cancers of the larynx led me to considerable enthusiasm for diathermy here, the subsequent course did not justify this, although I still believe small carcinomas of one cord without fixation or small doubtful tumors in older patients should receive diathermy under suspension as advocated by Novak.

Radiation therapy must be considered in connection with such cases as we are discussing. Recently a revival of the earlier enthusiasm that had rather lagged from indifferent results has come from its more intensive and studied application. Regaud of the Curie Institute in Paris, and certain English and American authors have recently reported remarkable results from the use of radium with repeated smaller doses or massive ones or from the so-called saturation method of Pfahler. As ordinarily employed, however, in serious cases I have seen little good from its use and because of it many patients who have come to us have been carried past the hope of saving only to be left with terrific and persistent pain. Radium, if unsuccessful, as Moure says, leaves little hope for other measures though it may be useful where surgery has been incomplete. The advertising of radium services implies that the ordinary medical man without special training or experience can with it get wonderful results in cancer. Many cases we have seen testify that this is a fallacy and a dangerous belief.

In small basal cell carcinomas of the skin and carcinomas of the cervix uteri, as Wood says, it has admittedly great value. In sarcomas, fibromas of the naso-pharynx, certain transitional carcinomas of the pharynx and tonsil it should have precedence. Elsewhere it may do more harm than good because it displaces more adequate treatment. Dr. James Percy from his extensive experience says: "Radio-active methods as usually employed are distinctly harmful, remotely and immediately. I have not seen any case of cancer of the tongue or neck who has lost his cancer following radium." Moure, Jackson, Clerf and others have pointed out its dangers in the larynx and McKenty thinks its use there pernicious.

*The disadvantages of radium:*

1. Displaces more adequate measures.
2. Produces much pain especially near bone or cartilage.
3. Produces hard scar which seals over disease and gives unwarranted sense of security and hides its failure until too late.
4. Is an easy method of exploitation or negligence.

*Read before Section on Eye, Ear, Nose and Throat, Peoria, May 22, 1929.

*From the Service of Oto-laryngology, Cook County Hospital.

*Advantage of surgical diathermy.* (After Milligan, Schmidt and others.)

1. Relative bloodlessness and lack of shock.
2. Blood and lymph spaces are sealed—there is little danger of inoculation metastases.
3. Heat generated in the tissue sterilizes it.
4. Heat has selective destructive action on cancer cells at the border.
5. Surrounding tissue is not devitalized—healing is good with smooth scar.
6. Recurrences show within few weeks and can be destroyed.
   (In one successful case we destroyed new growth five times before we got it all.)
7. Many cases obviously inoperable are amenable to diathermy—as tumors of the sinus, palate and pharnyx.
8. It is easy and rapid, precise and controlled.
9. Pain does not follow and precedent pain is relieved. (One of our greatest satisfactions has been the relief of pain caused by radium, especially near bone or cartilage.)

*Technic.* To briefly discuss technic, we use for coagulation a standard high frequency instrument giving a steady effect using a low or medium voltage and fairly high amperage, the amount being determined by its visible effect. A lead plate strapped with adhesive between the shoulders has proven the most practicable indifferent electrode. The cutting current may block out the whole tumor but more often a needle electrode is used to circumscribe the growth, and for precise effects; and we use the smaller and middle sized buttons to insure coagulation of sizable masses. Coagulated tissue is removed by the curette or scissors and coagulation carried definitely beyond the growth. The feel, developed by experience, of the needle in malignant tissue is a valuable aid to sight. Bone is killed if involved with the knowledge that it will cleanly sequestrate. Finally, the surface is desiccated and carbonized to prevent bleeding and to form a matrix that will stop premature separation, and we now rarely do tracheotomy simply to prevent aspiration. Ligation of important vessels, especially of the external carotid or lingual arteries, is usually advisable both to make the operation bloodless and to prevent secondary hemorrhage that may come from a large trunk when coagulated tissue sloughs. Great patience and thoroughness is required, though, unlike cutting surgery if we fail to get all of our new growth at first active proliferation is rare.

Our first important lesson with diathermy was that these cases must be treated courageously. Half way measures may do more harm than good and all of the malignant tissue must be destroyed, with a reasonable surrounding area, even if all except the most vital structures must be sacrificed. Nature heals rather kindly even very mutilating diathermy wounds and these patients, plucked from a terrible death, are grateful and contented, in spite of considerable defects.

The problem of anesthesia was at first a great difficulty. Now in many patients with preliminary scopolamine and morphin we get excellent results with block anesthesia or infiltration though, of course, great care is taken that the needle goes through no cancerous tissue. In other cases, we have found colonic ether after the method described by Frazier wonderfully satisfactory. Several misadventures with chloroform made us appreciate especially this substitute and we find that with it we get relaxation enough even for suspension larygoscopy, supplementing with drop ether if necessary up to the time of coagulation, and the danger of post-operative pneumonia seems almost gone.

Cancer of the skin or auricle, especially if at all extensive, is a particular field for diathermy as metastases may be very late. If the growth is small, monoterminal, direct or indirect diathermy is simple and efficient. A punctate area can with a very light current be removed with no visible scar. Larger areas can be circumscribed and removed almost to any desired depth. If cartilage or bone is involved it should be destroyed and the dead bone will separate in a few weeks.

In the nose or antrum exposure can be made through the palate or canine fossa or with a Nelaton flap, though we have found that the first exposure must be free, for best final results. If the skin of the cheek is already involved it may be destroyed by way of approach.

Cancer of the tongue is very satisfactorily treated if papillary and if on the margins or tip. If ulcerative and especially if far back, infiltration along the muscle bundles is usually rapid, considerably more must be removed and the results have not been so good.

Our carcinomas of the tonsil and pharynx have

not been seen early, extension has usually involved the great vessel and results have generally been only palliative (unlike MacKenzie's reports).

Results are better if the epiglottis is the site.

Dissection of the regional glands if enlarged seems important and we believe with Trotter, Patterson, Dan MacKenzie and other English operators that gland dissection should precede diathermy by ten days to two weeks because the area is clean and the patient's nutrition such that the procedure gives no serious shock. New, however, argues that secondary metastases may take place through newly established lymph drainage, and advises that gland dissection precede diathermy.

As most of these carcinomas about the head give general metastases only late, by hammering at the local areas we can frequently get real results. Altogether from a rather hopeless attitude in the face of cancer about the head, with diathermy we are mustering greater assurance as we see more of its results and feel very strongly we are successfully stopping many more early cases and greatly widening the field of operability in late ones.

636 Church Street.

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## DISCUSSION

Dr. George W. Boot, Chicago: The cases mentioned are the class of cases we get, cases that look absolutely hopeless, at the County Hospital. The results are conclusive.

Dr. Frank J. Novak, Jr., Chicago: I wish to subscribe to everything Dr. Galloway said in regard to the use of diathermy in treatment of malignant lesions about the head and neck. I think the secret is that one must be courageous; one must be heroic. Destruction of tissue must be extreme. You cannot worry about the cosmetic result if you expect to accomplish your purpose. The use of diathermy in the larynx is easy, and while Dr. Galloway said that small lesions are amenable to this treatment, I would say that any lesion is amenable, regardless of size, providing that it is strictly intrinsic, and that metastatic involvement of the tissues outside of the larynx has not occurred.

Dr. M. Reese Guttman, Chicago: During five years association with Dr. Joseph C. Beck I have had an opportunity of observing the results of diathermy in carcinoma. It is unfortunate that so many come too late, delayed frequently by being subjected to x-ray and radium therapy. Radiotherapy of malignancy of the head and neck except for the relatively benign skin carcinomata, is useless. Furthermore we do not know that diathermy will destroy a malignant cell before it affects normal tissue. Consequently we must choose our cases carefully. Any case to be amenable to electrologic surgery, must be well localized without local or general metastasis, and these offer the best chances for cure. We all have difficulty with the ether anesthesia on account of the sparking during electrologic procedures. We are using Avertin, also known as tribromethylalchol rectal anesthesia, first introduced in this country by my brother, Dr. Joseph Guttman. Many of you in Chicago have seen this used by Dr. Beck, Dr. Lederer and myself. Dr. Theobold has just used it at St. Lukes Hospital. There is one point that should be mentioned. In electrocoagulation one must be careful to first ligate the carotid artery as not infrequently serious secondary hemorrhage may occur. Since we have insisted upon a primary ligation of the carotid we have not had any secondary hemorrhage.

Dr. M. H. Cottle, Chicago: I have gone to the County Hospital on several occasions when Dr. Galloway presented a series of his cases. I was much impressed by his work, not only with the fact that he had achieved such remarkable results but also because of technic in handling the cases. Diathermy is not as easy to use correctly as it sounds. It is not just turning on the switch and letting the sparks fly where they will. He knows apparently just what he wants and where he wants it, and when you see the ease with which he does it, you might confuse simplicity with ability.

Dr. Thomas C. Galloway, Evanston: (in closing) I think we should not go out with the idea that we can cure all of these cases or the majority of them but we are certainly getting somewhere in the treatment of cancer about the head. Dr. Boot has been the inspiration of much of the work at the Cook County Hospital. He had kept us plugging at it when we thought the cases were hopeless. Novak was the pioneer in diathermy about the head around Chicago, and showed us the way. I rather expected to get a rise about radium and thought it would have some friends here. We have felt that radium has done a good deal of harm by tiding over the time when something could have been accomplished by diathermy. I think diathermy can do what radium can do and more. Wright of England shows a method of treating cancer of the esophagus; diathermy is used with a bougie electrode to widen the passage and has been found palliative. As to the current used it is a matter of experience. You cannot take it arbitrarily. You must adjust your machine to the resistance of the patient, and the tissues you are working on. We use much coagulation and little desiccation; in the east they use much desiccation.

# ELECTRICAL BURNS*

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CHICAGO

Mr. Chairman, Members of the Illinois State Medical Society, and Guests:

It is a pleasure and honor to have this opportunity of bringing to your attention for discussion the subject "Electrical Burns" which, to my mind, is in need of your co-operation to bring it to a more scientific basis of treatment than it enjoys today.

The selection of this type of burn for discussion has been determined by our familiarity with electrical accidents, having been associated for the past seventeen years with a number of the large public utility companies of Chicago and Illinois. During that time, through our Medical Department, we have had the opportunity of observing large numbers of these cases both under our personal care and under the care of our colleagues. We have witnessed practically all the various methods of burn treatment which, as you know, are legion. From the wealth of material at hand we were able to arrive at a conclusion as to the advantages and disadvantages of this large variety of therapeutics relating to burns.

Our intention is not to present any new methods in this field, which is already overcrowded, and we have nothing new or startling to offer. Our sole purpose is to refresh your minds, if you please, and to make the suggestion that burn therapy be given greater scientific consideration by our profession. A thorough scientific research is needed regarding methods of treatment of electrical as well as fire, steam and hot liquid burns, which will result in a standardization similar to the vast improvement in the treatment of fractures evolved over the last few years.

The old, obsolete and widely varying methods of treatment are directly responsible for prolonged convalescent periods with their accompanying economic loss to the patient and his dependents. Lack of scientific management of these injuries has resulted in complications, deformities and frequently fatal terminations of what appeared in the initial stages to be trivial injuries or burns of trifling degree. No longer, we believe, are burn cases left to the initiative of nurses or internes but it is imperative that we give to these cases the same careful consideration and apply the same aseptic, surgical technique used in abdominal surgery which, we have learned, is so essential.

In the past decade, the electrical industry has made vast strides in the production and distribution of electrical energy in the form of light and power. It is still in its infancy and each day witnesses some new use demonstrated for this form of energy, both in the home and in the fields of manufacture and commerce. The constant and ever increasing consumption of electrical current of high voltage brings with it a mounting toll of electrical accidents. Wonderful achievements have been accomplished by the large power companies in safeguarding their employes and customers from the hazards of electrical force but notwithstanding their success in accident prevention, there still is and will continue to be, a great number of injuries of this class to be treated by the medical profession.

Doctors who do not see this class of injury frequently are ofttimes unaware that many of the most serious burns and electrocutions result from currents of low voltage. The severity of an electrical burn depends upon the nature of the current (whether alternating or direct), the voltage and amperage of the current, the character of the ground connection, duration of contact and the extent of surface involved. Electrical injuries are classified as follows:

Electrical shock, where the patient is electrified to a point where there is an apparent suspended animation with an arrest of respiratory effort.

Electrical flashes or glare injury to the eyes.

Electrical burns of a first degree with a simple hyperemia of the skin surface which has a dry appearance, early blister formation and pain.

Second degree burns where the continuity of the skin surface is destroyed.

Third degree burns where there is destruction en masse of the tissue, perhaps including muscle, nerve and bone.

Experience has demonstrated that where there is fair contact with electrical current of sufficient voltage, there will be found on the anatomy what is known as the "contact spot" which marks the

*Read before the Section on Surgery, Illinois State Medical Society, Peoria, May 21, 1929.

current's ingress or egress, or both. This may be pinpoint or large in size, but it is there for the looking and is important from a medical-legal standpoint. Difficulty is often experienced in determining the extent of burned area and its depth of penetration and great care should be exercised in the prognosis of this type of burn case since many burns appearing trivial in the first twenty-four hours later become critical or fatal. Experience has taught us to be guarded and treat all burns as serious until sufficient time has elapsed to make prognosis a certainty.

There is an immediate electrical shock to the nervous system accompanying all electrical burns which is a prominent factor in reducing the patient's resistance to pain and which also delays the normal reaction time. Many patients die from electrical shock in the first twenty-four hours on account of respiratory failure or heart block and this has often lead to the erroneous belief that death was due to burns or so-called static pneumonia. After a few days a secondary toxic shock ensues which is due to the absorption of toxines from the destroyed tissue and may be accompanied by bacterial invasion. This toxic shock has very often resulted in death which was attributed to pneumonia because the nature of the pathology at hand was not understood.

The initial entrance of the electrical current into the body shocks a patient's mental and nervous equilibrium, inducing in him a state of fear and apprehension. This is greatly aggravated by excitement and mishandling within the first few hours after the accident.

Electrical burns in themselves are primarily aseptic by reason of the sterilization obtained from the tremendous heat generated in the arcing of the current and the body. The burns are often multiple, one appearing where the current entered the body and the other where the current left the body when contact was broken. The tissues present a charred, cooked appearance, the surface is dry, dehydration is marked, the wounds are clean cut in outline, and later a definite area of hyperemia surrounds the burned area. Hemorrhage is practically absent even when large blood vessels have been destroyed but secondary hemorrhage is one thing to fear and hard to control when once established. Generally, secondary hemorrhage follows after shock has been controlled and the arterial tension rises. A patient may be delirious or unconscious, a rapid, thready pulse is felt, there may be rapid, shallow respirations of the hunger type or almost complete absence of same, and an anxious face, pale skin with dry surface due to depletion of body fluids. Temperature may be subnormal and later begin to rise and if this continues, it is almost a fatal sign. Prostration is marked, the patient moving very little on account of pain and fear, even where pain is absent. The kidney function is diminished on account of dehydration of body fluids and this is a sign of utmost importance. Thirst is present in a large percentage of cases.

What constitutes good management in electrical burn cases? Please bear in mind that these suggestions are offered in the hope that our experience may prove of some value. Since a large percentage of electrical burns occur in outlying localities not immediately accessible to doctors, it is most essential that the lay workman be instructed how to render resuscitation from electrical shock and how to protect the burned area until medical aid arrives. All employes of the public utility companies with which we are connected have been instructed in the above principles which consist of the Schaefer Prone Pressure method of artificial respiration, application of sterile gauze to the burn and immediate transportation of the patient to the nearest doctor or hospital.

Severe cases require treatment of shock in a hospital with rest in bed, complete relaxation and sufficient dosage of morphin to secure freedom from pain. Fluids should be forced at once by mouth and normal saline or a hypertonic saline should be given by transfusion or hypodermoclysis. The latter should be done with caution on account of the possibility of lung congestion. Kidney function should be restored early and this is one of the guides to the prognosis of the case. Sodium bicarbonate by mouth is of value in establishing the alkaline balance in the body. Placing a patient in semi-Fowler position and frequently changing same will often prevent respiratory complications. Very often, patients are unable to relax on account of trying to avoid pressure on burns. This is a further strain on their resistence and can be overcome by the judicious placing of pillows and sand bags. The patient should be placed on sterile sheets and a cradle made with a sheet placed so as to pre-

vent the pressure of bed clothes. One or two carbon filament electric bulbs placed under the tent will maintain the body heat and avoid the possibility of chilling the patient. The heat also serves to induce moisture or elimination from the skin.

Where possible, surgery should be withheld until later hours, after shock has been arrested. Application of sterile petrolatum without bandaging is sufficient until one of the preferred burn treatments is at hand. We have used petrolatum for first and second degree burns only, and believe that greases, ointments and salves are only indicated in these two types of burns. They are messy and gruesome and make the patient uncomfortable. They favor bacterial growth and when it is necessary to remove them in favor of other therapy, there is great difficulty and pain.

In the initial stage, in serious burns of the second and third degree type, the treatment indicated is tannic acid application. A two or five per cent. aqueous solution of tannic acid is sprayed on the burn with an atomizer and repeated until the wound appears a dark brown or mahogany color. If a spray is not available, apply on loose gauze. There is almost an immediate cessation of pain and the patient experiences relief in body and mind. The tough membrane that forms on the burn surface will, in ten days, begin to curl at the edges and separate, leaving healthy tissue beneath. In third degree burns the membrane will separate within twenty-four hours, due to the exudate from the wound and will require subsequent applications of the tannic acid. If sepsis appears, it is important that this membrane be removed surgically under anesthesia and the septic wound treated as any other infected wound. It is suggested that a trial be given the normal horse serum with 0.35 per cent. cresol in these wounds, as advocated by Doctors Monteith and Clock after the method introduced by Doctor E. P. Robinson. The serum is said to favor the coagulability of the blood and retains the blood plasma in the wound. It forms a physiologic base which favors tissue cell growth. The cresol acts in a bactericidal manner and as a preservative to the serum. Infection in burn cases may be controlled, as recommended by Doctors Blackfoot, Bennett and Browning, by a one to five thousand Acriflavin applied on fluffy gauze. Where toxic shock is present the above method is of value but any recognized treatment for infected wounds is a matter of choice. Irrigation of the toxic wound area with sodium chloride solution reduces the absorption from toxic material. Should the slough be the offending media, it must be removed surgically under anesthesia and asepsis.

I have purposely refrained from mentioning picric acid treatment of burns as we have found it of value only in the first twenty-four hours. After that time its toxic effect irritates the tissues and may produce toxic symptoms of nausea, dizziness, gastric upset, temperature, and simulate toxic shock. We have observed that patients treated with picric acid present these signs which disappeared when the picric acid was discontinued. We have found paraffin treatment of wounds of value in first and second degree burns but not of practical use in large, destructive wounds. It requires frequent redressing with the added danger of causing sepsis in the wounds. Our technique may have been at fault, but we discarded paraffin after a few distressing infections not accounted for otherwise.

Regarding surgical procedure in burns, it is good surgery, we find and believe you will agree, to withhold all surgical procedures except emergency control of bleeding if present, until the patient has rallied from the initial shock. Opening of bleb and blister formations should be done under strict asepsis. We have observed one doctor who pinched the blisters with his fingers in order to break them. The removal of devitilized tissue should be limited to shreds that are loose and easily removable. It is better to await the separation of the slough before debridement is attempted and this should be done under anesthesia. Early debridement is difficult on account of the loss of anatomical fascia planes. The danger of producing an alarming hemorrhage, almost impossible to control, is a grave possibility. Nerve destruction is of such extent in these burns that approximation of nerves will be well nigh impossible, but after complete healing of wound, may be attempted. Injury to bone and tissue will be so great that amputation is imperative but this should be delayed until shock is overcome.

The burned area being free of infection and if there is a healthy bed of granulations, it is sur-

gically wise that early skin grafting be performed. This is to prevent disfiguring scars and contractures, especially where the burns involve the flexor surfaces of joints. We have found that the early Thirsch grafts, taken from the patient's own thigh, have given the best results. The use of a hot air dryer to assure a dry field before application of the skin grafts, is of value. Also, it is essential that there be sufficient, but not too great pressure to hold the grafts to the bed, and also proper protection of the grafts by any of the classical methods. The final admonition is to avoid too frequent inspection or dressing changing, if the operation is to be a success.

The area being of considerable extent, the use of full thickness grafts or the pedicle graft as advocated by Doctors Koch and Kanavel, being careful that the exact tension is had in suturing the graft to the healthy skin. This procedure will hasten the return of the patient to an economic basis in shorter time instead of waiting for the wound to close of itself with accompanying scars and contractures. Speaking of contractures, permit us to make the suggestion of careful posture of the part with gentle, daily active and passive motion. Where opposing surfaces of raw tissue are in contact, separate the parts, place in useful functional position and retain by use of sand bags. We have attempted plastic repair in a number of cases where the arm had become attached to the thorax and axilla by being left in contact during the healing process, and failure of complete functional restoration has occurred in some cases which might have been prevented had posture been used.

We have met with successful encouragement of healthy granulations in a number of cases by the judicious use of quartz light therapy. The use of mercurochrome has been discarded on account of the crust formation favoring germ propagation. These patients are very frequently in a greatly reduced state of resistance and a building up of the general health will be productive of granulations which appear as if by magic. Maintenance of the patient in bed until the active stage is passed and then out in the sunshine, is a very good tonic for burn cases in children and elderly people.

Physiotherapy, intelligently and scientifically applied, has a very definite part in burn therapy, in the restoration of function to a part. It will aid in reducing contractures and in preventing fibrosis in joints from long periods of disuse. Early massage, active and passive motion and work movements are of value. Never move a part to the point where it is painful to the patient. X-ray has often been used by us to soften scar tissue and reduce keloid formation, with good results. Protection of the skin area from irritation by clothing, is a point worth holding in the prevention of keloids and irritable scars. Reparative work or plastic surgery should be held in abeyance until wounds are completely healed and free of infection. A fair guide as to the time to plan plastic procedures is when the limit of scar tissue and contractures is known.

Children stand the rigors of burns better than adults. With advancing age, mortality is higher. Apparently trivial burns over the epigastrum have resulted in gastric or intestinal perforations of a pre-existing ulceration, with fatal results.

In conclusion, permit me to sum up, as it were, those factors which to our minds and from our experience, should receive consideration:

Treat all burns as serious, no matter how trivial.

Combat effects of initial electric shock.

Early use of tannic acid and normal horse serum in extensive burns.

Avoidance of early surgical intervention.

Prevention of toxic shock.

Early skin grafting especially over flexor surfaces.

Surgery of nerves and tendons when all infection has passed.

Early scientific physiotherapeutic measures.

The above measures are directed toward the classical burn treatment which is both conservative and rational, namely, preservation of the sterility of the wound, use of the treatment which favors separation of the slough, encouragement of the growth of new granulations, combatment of the toxic shock due to toxine absorption, and returning the injured person to a gainful occupation with the least delay commensurate with welfare and safety.

With these thoughts in mind we have selected this subject and make the final plea that greater attention be directed toward this phase of injury so that there will be less of the prolonged

and disabling complications from electrical burns.

I thank you.

DISCUSSION

Dr. Hart E. Fisher (closing): We do use blood transfusions, especially where there is a septic condition and when the resistance fails to come back. We use the direct method and also a saline solution to encourage the resistance and break up and combat acidosis.

## HEART DISEASE IN PREGNANCY*

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During pregnancy there is a noticeable tendency to blame the pregnancy itself for many things.

If vomiting occurs the gravid uterus is held responsible, and it may well be, but so too may gall bladder disease, pyelitis or central nervous system derangement be the cause. Headache, nervousness and increased blood pressure likewise are frequently attributed to pregnancy without consideration of the possibility of accidental disease such as hyperthyroidism.

There is a similar tendency to emphasize the influence of pregnancy on diseased hearts and this emphasis may be directed to either extreme —to total disregard or unreasoning fear of the heart condition. Heart disease varies in pregnancy as it does under other circumstances. We have all seen the patients with heart disease survive severe pneumonias. We have all seen patients with heart disease doing hard physical labor with no apparent ill effects and patients with similar lesions able to do but the lightest work. What is more significant we have seen patients suffering from symptoms of heart failure because of excessive work incident to their occupation, who, when placed in occupations decreasing the amount of effort, become symptomless and carry on indefinitely.

Bearing of children is an occupation demanding a certain amount of rather uniform work. Patients who are subjects for this type of employment have other points in common which add to the uniformity of the group under discussion.

They have youth, they are otherwise healthy. They rarely have vasculo-renal complications. Their usual work—housekeeping—is similar though varying in amount.

And most important, from the standpoint of heart disease itself, they are more uniformly favorable to treatment. They are the 'survivors of the fittest'; the bad cases of endocarditis of childhood have either died or become such invalids that they do not marry and become pregnant.

There are exceptions, of course, but they are comparatively rare. For the most part patients with heart disease complicated by pregnancy have had their active carditis, with or without rheumatic manifestations, some years prior and have improved to the point at which they suffer relatively little limitations.

In management of heart disease the condition we fear and hope to avoid, is heart failure. The factor most frequently producing cardiac decompensation is excessive work and the amount of work which may produce it varies greatly in individuals.

During pregnancy there is a gradual increase in work. Among the changes producing this increase are increased mass and weight, increased circulatory bed and possibly some circulatory handicaps due to the increasing tumor. These extra demands, plus the desire or necessity of the patient to carry on her regular work, may prove excessive.

The object in management is to prevent heart failure during pregnancy; if failure does not occur during the long months of pregnancy it seldom occurs because of labor. In our experience at the Chicago Lying-In Hospital, of those patients who suffered failure during pregnancy, 40 per cent also experienced some degree of failure because of labor, unless the labor was modified by obstetrical means. On the other hand if there was no decompensation during pregnancy less than one per cent developed signs of failure during labor.

Labor is a factor that cannot be estimated beforehand in terms of work, but it is usually shorter and less strenuous in cardiacs and, furthermore, it is a factor that can be controlled by good obstetrics. The surgical and obstetrical skill of the obstetrician can minimize the amount of actual work and thereby the risk of delivery. If we can carry our patient through pregnancy without failure and present her for delivery in

*Read before the Illinois State Medical Society, Peoria, May 22, 1929.

a state of good cardiac compensation, the obstetrician seldom fails to deliver her safely.

Our duty is to prevent heart failure and we may do this mainly by offsetting the unavoidable increase in work due to pregnancy by decreasing the voluntary effort of the patient. This necessitates seeing patients early—before the fourth month—at which time we can, in addition to regulation of their voluntary work as a protective measure, in many instances increase the efficiency of the heart by proper rest and exercise and the judicious use of digitalis if necessary.

The importance of early observation has been demonstrated to us by comparison of our earlier results, when patients were coming under observation at about the sixth month and the percentage of failure of some degree was about twenty, and our more recent results obtained by bringing patients under management at the second, third or fourth month, such a procedure reducing the incidence of failure to less than 10 per cent.

The type of valvular lesion makes little difference, preservation of the myocardial efficiency is the important phase and so to this end our efforts should be directed.

The method of delivery varies with the circumstances governing the individual case. Spontaneous labor and delivery is usually safe. The labors are short and easy as a rule unless there is an obstetric complication. Forceps applied when complete dilatation has occurred is a further safeguard for this method.

I believe this is the preferable means of delivery unless there are other considerations, such as occurrence of failure during the pregnancy which indicates forceps, at the earliest possible moment, or cesarean section. Old primiparae, pelvic distortion, disproportion, etc., conditions which are apt to prolong or increase labor indicate cesarean section.

Patients with heart lesions serious enough to contraindicate subsequent pregnancies and in whom sterilization is desired are probably best treated by cesarean section with sterilization at the same time.

CONCLUSIONS

1. With careful prenatal care and timely, efficient obstetric aid, heart disease and pregnancy is not necessarily a fatal nor even fearsome combination.

2. Not every woman with heart disease should attempt pregnancy.

3. For the most part, those who should not, do not.

4. That the early care is the important phase of management in the prevention of trouble during pregnancy.

5. That the obstetrician of today with his obstetrical and surgical skill can minimize the work of labor to such a degree that the danger from delivery is little more than that of pregnancy.

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## THE IMPORTANCE OF AN X-RAY EXAMINATION OF THE GENITO-URINARY TRACT IN OBSCURE ABDOMINAL AND BACK PAINS

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An analysis of cases presenting abdominal and back pains emphasizes the fact that diseases of the kidney and ureter do not usually present a clear cut clinical syndrome. It is interesting to note the diversity of lesions of the genito-urinary tract which simulate other abdominal and back diseases.

A statistical survey by Nichols[1] of a large number of patients shows that more than 30% of their cases in whom a definite pathological condition of the right kidney was discovered had previously undergone operations for some condition not related to the kidney; and the subsequent history indicated that in many cases the symptoms had not been relieved. One should not infer from the previous statement that in many cases the surgical treatment was not justified, as not infrequently multiple abdominal lesions exist. The fact remains that too often an exact diagnosis is extremely difficult, and that one should not fail to utilize the precise methods of analysis which science has made available.

Because of the multiplicity of abdominal and back lesions simulated by genito-urinary disease an exploratory operation is not wholly justified until an X-ray examination of the genito-urinary tract has been made to ascertain whether

or not that organ may be in part or wholly responsible for the pain.

It has often been stated that the patient cannot afford an X-ray examination. This condition, in my opinion, is more apparent than real, as not infrequently the information obtained from a roentgenological examination may save the patient the expense, inconvenience and discomfort of a needless operation.

The following cases are illustrative of the importance of an X-ray examination of the genito-urinary tract in obscure abdominal and back pains.

Case 1. A female, aged 22, was admitted to the hospital with a past history of having an appendectomy two years ago.

Present Complaint: The patient has complained of pain in the right lower abdomen and back with attacks of nausea and vomiting every three months for the past two years. An appendectomy two years ago did not alleviate the symptoms.

Roentgen Findings, October 5, 1927: X-ray examination of the genito-urinary tract revealed a stone in the pelvis of the right kidney. The calculus was displaced into the upper calyx of the kidney subsequent to the insertion of an opaque radiographic catheter into the right ureter. Roentgenograms taken in the lateral view revealed that the calculus was located at the anatomical site of the pelvis of the right kidney. Roentgenograms taken in the A.P. and lateral views, subsequent to the injection of 8 c.c. of sodium iodide into the right ureter, revealed that the shadow of the calculus was obscured by the iodide. The major and minor calyces were increased in size and there was a clubbing of the minor calyces. The findings are those of a stone in the upper calyx of the right kidney associated with the findings resultant from a hydro nephrosis.

Cystoscopic Findings: Cystoscopic examination revealed that the mucous membrane was slightly congested. There was normal spurting from both ureters and clear. The catheters were passed with ease on both sides.

Remarks, May 11, 1928: A right nephrostomy was performed and a stone was removed from the upper calyx of the right kidney about the size of a jelly bean; the patient made an uneventful recovery.

The important feature in this case is that the lesion in the right kidney so closely simulated an appendicitis that an appendectomy was performed with no relief of the symptoms until the stone was removed from the right kidney.

Case 2. A male, aged 39, was admitted to the hospital with a past history which was not remarkable. Present Complaint: The onset occurred ten months ago when the patient stated he injured his left back. Since that time he has complained of recurrent pains in the upper left back region. The pains radiate down to the sacrum and to the left leg. Recently there was some frequency in urination.

Laboratory Findings: Occult blood in the urine. Roentgen Findings, May 12, 1928: X-ray examination of the genito-urinary tract revealed that the right kidney was negative. On the left there was a shadow of increased density at the anatomical location of the pelvis of the kidney. Roentgenograms taken in the lateral view revealed a well defined shadow of density, that of stone, in the anatomical site of the pelvis of the kidney. The findings are those of a stone in the pelvis of the left kidney.

Remarks, May 12, 1928: Operation, nephrotomy. A stone was removed from the pelvis of the left kidney.

The interesting feature in this case is that the patient attributed the attacks of pain to his injury which in point of view of the history of the case is somewhat misleading.

Case 3. A male, aged 43, was admitted to the hospital with a past history of typhoid fever twenty-five years ago.

Present Complaint: For the past year he has had indigestion. Ten days ago, the patient had an acute onset of general abdominal pain which was diffuse in character and associated with right back pain. There was nausea and vomiting. There were no urinary symptoms.

Roentgen Findings, April 20, 1928: X-ray examination of the genito-urinary tract revealed a faceted calculu at the site of the pelvis of the right kidney and at the site of the gall bladder. Roentgenogram taken in the lateral view revealed that the calculus was well seen at the region of the pelvis of the kidney and which was extrinsic of the gall bladder. An examination of the gall bladder by the Graham method revealed that the gall bladder was normal. An X-ray examination of the gastro-intestinal tract was negative. The findings are those of a stone in the pelvis of the right kidney at what appears to be the pelvic-uretero junction. There is an enlargement of the kidney. The gall bladder, stomach and appendix are normal.

Cystoscopic Findings: Cystoscopy refused.

Remarks, April 21, 1928: Operation revealed an enlarged kidney with an inflammatory mass about the pelvis of the kidney; the stone was not palpable. A nephrectomy was performed and a stone was removed from the inflammatory mass at the site of the kidney pelvis. There was an associated pyelonephritis.

The interesting feature in this case is that the lesion at the right kidney very closely simulated gall bladder colic.

Case 4. A male, aged 67, was admitted to the hospital with a past history of prostatectomy and strictures, in 1916.

Present Complaint. The patient had been well until four months ago, when he complained of pain in the left lower quadrant, constipation, shortness of breath and weakness. There were no genito-urinary symptoms.

Roentgen Findings, July 27, 1926: X-ray examination of the genito-urinary tract revealed a large branching calculus of the left kidney occupying the pelvis and calyces. Cystoscopic Findings. Examination was not done.

Remarks, July 28, 1926: A left nephrectomy was performed. Section of the kidney revealed a large amount of purulent material with a large branching calculus.

The important feature in this case is that the lesion of the left kidney simulated lower abdominal pathology which was more suggestive of malignancy of the bowel.

Case 5. A female, aged 39, was admitted to the hospital with a negative past history.

Present Complaint. The onset of the illness was four months ago when the patient complained of pain in the right abdomen and back, radiating downward. There were no genito-urinary symptoms.

Roentgen Findings: X-ray examination of the genito-urinary tract revealed several small shadows of increased density consistent with calculi at the region of the lower calyx of the kidney. Film taken after the injection of 7 c. c. of sodium iodide revealed that the calculi were partially obscured by the shadow of the iodide in the calyx and the calyx at this region was blunt and had lost its saucer shaped expansion. The upper calyx revealed some irregular fuzziness. The findings are those of several stones in the lower calyx of the right kidney associated with the findings seen resultant from a hydronephrosis. These findings are consistent with a tuberculous kidney.

Remarks. The interesting feature in this case is that the lesion of the right kidney simulated lower right abdominal and back pain of obscure character as to the etiology.

Case 6. Male, aged 44, was admitted to the hospital with a past history which was negative.

Present Complaint. The patient complained of pain in the lower abdomen, first on the right side and later on the left. The onset of pain was one year ago. There was no genito-urinary complaint.

Laboratory Findings. Occult blood in the urine.

Roentgen Findings, November 8, 1928: X-ray examination revealed a calculus in the lower right ureter approximately 1 cm. from the bladder orifice. November 20, 1928: X-ray examination of the genito-urinary tract revealed no stone at the site of ureter as previously described.

Cystoscopic Findings. Right ureteral orifice inflamed and edematous. No spurting of urine. Left side normal. The right ureter was dilated.

Remarks: November 9, 1928, or the night following ureteral dilatation, the patient passed the calculus with subsequent relief of symptoms.

Case 7. A female, aged 21, was admitted to the hospital with a past history of having had an appendectomy in 1925.

President Complaint. For the past two years, patient had complained of right backache associated with severe cramp-like pain in the right lower quadrant, more marked for the last three months. For the past three months there have been attacks of chills, fever and vomiting. Roentgen Findings, April 6, 1927: Roentgen examination of the genito-urinary tract revealed the uninjected film was not remarkable. Films taken of the genito-urinary tract subsequent to the injection of 7 c.c. of sodium iodide into the right ureter revealed that the pelvis and the major and minor calyces were increased in size, and the calyces revealed clubbing. The minor calyces have lost their saucer shaped expansion. The infiltration of iodide into the parenchyma of the kidney is consistent with a necrosis of the kidney substance at this region. The ureter was also increased in size. The findings are those of a hydro-ureteronephrosis accompanied by a destruction of the kidney substance in the upper calyx. Findings of this character are due to tuberculosis.

Cystoscopic Findings. Left ureter normal and spurting clear fluid. Right ureteral orifice inflamed and edematous. Urine cloudy.

Remarks, April 8, 1927: Operation—right nephrectomy and ureterectomy. Pathological findings: Tuberculosis of the kidney and ureter.

The important feature in this case is that the lesion in the right genito-urinary tract so closely simulated an appendicitis that an appendectomy was performed with no relief of symptoms. The patient at the present time is perfectly well.

Case 8. A male, aged 32, was admitted to the hospital with a past history that was not remarkable.

Present Complaint. For the past eight years, patient has complained of left back pain and from time to time has passed some stones. However, at present time there are no urinary symptoms.

Laboratory Findings. Revealed occult blood in urine.

Roentgen Findings, December 13, 1926: Roentgen examination of the genito-urinary tract revealed the kidney on the right was obscured by gas and fecal material. However, the catheter in the right ureter lay very close to the spine, and was rather parallel to the spine. There was no demonstrable evidence of opaque calculi in the right genito-urinary tract. On the left the tip of the radiographic catheter lay opposite the transverse process of the second lumbar vertebra and was a considerable distance away from the spine. There was a marked amount of calcareous degeneration and calculi in the kidney region. The shadow of the kidney was somewhat low and it was superimposed over the shadow of the psoas muscle. The kidney was close to the lumbar spine. Conclusions. Radiographically, the findings of a kidney whose shadow superimposes that of the psoas muscle and lies close to the spine and parallel to it, and associated with a kidney which is slightly low in position and rotated, are characteristic of the findings seen in horseshoe kidney. The findings of an irregularity of the kidney with calcareous degeneration and calculi are consistent with the findings seen in tuberculosis;

namely one-half of the horseshoe kidney is tuberculous.

Cystoscopic Findings. Right ureteral orifice normal. Normal spurting and clear. Left ureteral orifice inflamed. Urine cloudy. A pyelographic study was refused.

Remarks, December 16, 1926: Operation revealed a horseshoe kidney with gross tubercular involvement of one-half to the left of the spine.

The important feature in this case is that the pain in the left back was obscure. However, the history of passing stones with a laboratory finding of blood in the urine certainly makes one very suspicious of disease of the kidney. However, a case of tuberculosis in one-half of a horseshoe kidney is certainly a very uncommon one, and the most important aspect is that the roentgenological examination may elicit the diagnosis of a horseshoe kidney.

Case 9. A female, aged 51, was admitted to the hospital with a past history of having had a right nephrectomy two years ago, and prior to that time, a left mammectomy and pan-hysterectomy.

Present Complaint. Patient complained of pain in the left upper abdomen which was associated with a general backache. The pain at times was agonizing in character, and most of the time dull. There were no urinary symptoms. No blood in the urine. No loss of weight.

Roentgen Findings, October 12, 1927: Films taken of the genito-urinary tract revealed that the kidney shadow on the right was not visible. On the left the shadow of the kidney was increased in size and the lower pole has somewhat of a lobulated appearance. There was no evidence of opaque stones in the left genito-urinary tract, nor was there any evidence of calcareous degeneration in the kidney. The findings of a kidney which is increased in size, whose lower pole reveals a lobulated appearance, in the absence of calcareous degeneration is consistent with a polycystic kidney.

Remarks. The important feature in this case is that the etiology of the pain was obscure. However, the roentgen findings in conjunction with a history of a right nephrectomy two years ago, with a pathological report of a polycystic kidney, with a knowledge that polycystic kidneys are practically always bilateral, makes a diagnosis at the present time possible. Under medical management the patient made an uneventful recovery.

Case 10. A male, aged 32, was admitted to the hospital with a past history which was not remarkable.

Present Complaint. For the past eight months the patient had complained of epigastric distress and headaches. An acute attack was characterized by severe pain in the right back and vomiting with epigastric distress.

Roentgen Findings, January 12, 1927: Subsequent to the insertion of an opague radiographic catheter into the right ureter examination of the genito-urinary tract revealed that the tip of the opague catheter was seen in the mid-portion of the sacrum, and the catheter was coiled at the region of the lower end of the ureter. The kidney shadow on the right was fairly well visualized and as far as could be determined was not particularly increased in size. Roentgenogram taken of the genito-urinary tract subsequent to the injection of sodium iodide into the right ureter revealed that the ureter was considerably increased in size, and was very tortuous. The coils of the catheter which was previously described lay in the dilated ureter. There was no reflux of iodide into the bladder. The pelvis and calyces were likewise considerably dilated. The findings are those of a marked degree of hydro-ureteronephrosis, resultant from a ureteral stricture, at what should be about the vicinity of its orifice in the bladder.

Cystoscopic Findings. Revealed that the left ureter was not remarkable. The right ureteral orifice was inflamed, however, spurting. The stricture was dilated as was done on another subsequent occasion.

Remarks. The important feature in this case is that a stricture of the ureter resulting in a marked hydrouretero-nephrosis, simulated gastric and gall bladder disease.

Case 11. A female, aged 46, was admitted to the hospital with a past history which was not remarkable.

Present Complaint. Onset ten days ago. Patient complained of pain in the right lower back region with constant desire to urinate. The physical findings were those of a large tumor mass in the lower left abdomen.

Roentgen Findings, August 26, 1926: Examination of the genito-urinary tract revealed that the left kidney was fairly well visualized and appeared to be not remarkable as to size, position and no evidence of calculi. There was a well defined shadow of homogeneous increase in density which was situated in the left pelvis and abdomen. The character of the shadow is consistent with that often seen in fibroids of the uterus. The right kidney was not remarkable. Roentgen diagnosis. There is no evidence of opaque calculi in the genito-urinary tract. The kidneys appear to be normal in size, position and outline. The findings are consistent with a large fibroid of the uterus situated in the left pelvis and abdomen.

Cystoscopic Findings. The cystoscope was introduced into the bladder with difficulty, due to an extrinsic tumor mass which was pressing down and distorting the bladder. Urine from the left ureter slightly cloudy. Urine from the right ureter was cloudy. Pyelographic study was not made.

Remarks. Laparatomy revealed multiple large fibroids which were obstructing the ureters and resultant in acute pyelitis. A hysterectomy was performed.

The interesting feature in this case is that the pain was in the right back, accompanied by

a constant desire to urinate and associated with a tumor mass in the lower left abdomen, and that the acute pyelitis was due to an extrinsic obstruction of the ureters.

Case 12. A male, aged 65, was admitted to the hospital with a past history that one year ago he had a cystoscopic examination of the bladder, and he was told that he had a tumor.

Present Complaint. Patient states that for the past year he has had pain in the right abdomen associated with nocturia. Very recently he has expectoated blood.

Laboratory Findings. Revealed occult blood in urine.

Roentgen Findings, September 11, 1926: Roentgen findings revealed that the left kidney was not remarkable. On the right the kidney shadow extends from the twelfth dorsal spine to below the crest of the ilium. Roentgenograms taken of the chest revealed multiple metastases. Roentgen diagnosis. The increase in size of the right kidney with the findings of metastases in the chest is consistent with a hyper-nephroma of the right kidney with pulmonary metastases.

Cystoscopic Findings, September 11, 1926: Cystoscopic examination revealed bloody urine in the bladder and no evidence of a tumor. There were, however, numerous blood clots. Urine from the left ureter was clear and from the right bloody. Pyelographic study was not made.

Remarks, September 14, 1926: Right nephrectomy. The kidney was about the size of a grape fruit. Pathological findings were hyper-nephroma.

The important feature in this case was that the right abdominal pain associated with nocturia is not indicative of a kidney tumor. However, the roentgen findings of a very large tumor of the right kidney with metastases to the lungs makes an obvious diagnosis.

Case 13. A male, aged 59, was admitted to the hospital with a past history that was not remarkable.

Present Complaint. Patient states that for the past year he has had gas pains associated with nausea, vomiting and weakness. There was occasional marked epigastric distress. He has lost thirty-five pounds in one year. There was no genito-urinary complaint.

Roentgen Findings, April 13, 1928: The left kidney was not remarkable. The right kidney was considerably increased in size, extending from the twelfth dorsal to below the crest of the ilium. Roentgen examination of the gastro-intestinal tract revealed the stomach was normal. The ascending colon was displaced to the left and invaginated by an extrinsic tumor mass at the region of the kidney and free from the colon and liver. Roentgen diagnosis. The findings are those of a large tumor of the right kidney which has considerably displaced the ascending colon to the left. In all probability this tumor is a hypernephroma.

Cystoscopic Findings. Examination not done.

Remarks, April 18, 1928: Operation revealed a large kidney tumor which on section was a hypernephroma. The interesting feature in this case is that the clinical findings very closely simulate malignancy of the gastrointestinal tract.

### CONCLUSIONS

1. Diseases of the kidney and ureter do not usually present a clear cut clinical syndrome.

2. Lesions of genito-urinary tract frequently simulate other abdominal and back diseases.

3. Because of the multiplicity of abdominal and back lesions simulated by genito-urinary disease an exploratory operation is not wholly justified until an x-ray examination of the genito-urinary tract has been made to ascertain whether or not that organ may be in part or wholly responsible for the pain.

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## THE USE OF ORANGE JUICE MILK IN INFANT FEEDING*

KING GRIER WOODWARD, M. D.

ROCKFORD, ILL.

The baby of today who is unfortunate enough not to receive breast milk must cast its lot with myriads of others who are fed on formulae ranging from the canned milks to the simple cow's milk and water mixtures depending upon the choice of the practitioner. Fortunately the infant's digestive apparatus is elastic enough to adapt itself to many of the numerous methods of feeding. It is impossible to follow any one set formula or method and the practitioner who is called upon to prescribe a formula must not only understand the basic principles of infant food requirements but also be able to make adjustments to take care of digestive disturbances as they arise.

The use of acidified milk has held an important place in infant feeding in recent years, and it is one form of this subject that I wish to discuss today; namely, "Orange Juice Milk."

I can claim no originality in this field nor do I offer a panacea for all feeding problems, but hope to bring before the general practitioner a

*Read before the Section on Medicine, Illinois State Medical Society, Peoria, May 23, 1929.

highly satisfactory method from the standpoint of physician, mother and baby.

Dr. Julius Hess and his coworkers[1] have ably demonstrated the value of orange juice added to milk, in that it modified peptic digestion and increased the amount of soluble proteins. Hess and Matzner[2] in their work on lemon juice and orange juice in milk found that the hydrogen ion concentration was altered from a ph of 6.5 to a ph of approximately 5.4. In addition to the above mentioned factors the mineral constituents as well as the antiscorbutic vitamines are increased.

In the preparation of orange juice milk one ounce of strained orange juice is used to each sixteen ounces of milk.[3] The quantity of milk prescribed when beginning the formula should be two ounces per pound of body weight, and cane sugar added in the proportion of one-tenth of an ounce per pound of body weight. If greater volume is desired water may be added in sufficient quantities. It has been my practice to advise the mother to boil the milk and water in a single boiler for two minutes, add the sugar, and then cool the mixture thoroughly before adding the orange juice.

I have used this type of formula in premature infants, during the first few days of life before the establishment of breast milk, as a complemental feeding, and in the ordinary bottle fed infant with highly gratifying results. For the past three and a half years every infant admitted to the Rockford Children's Home has been given orange juice milk until they were ten or eleven months old, when whole milk was used. In comparing two hundred cases in private practice fed orange juice milk with an equal number fed other forms of milk mixtures I have found that the infants on the orange juice milk mixture required fewer adjustments of the formula, have an average greater gain in weight per month and are less troubled with intestinal upsets. The curd is very fine and the stools closely approximate those of a breast fed baby. At certain periods of the year when the oranges are more sour it may be necessary to diminish the proportion of orange juice to avoid excessive flatulence and occasional loose stools.

Raw egg yolk[2] [3] may be added to orange juice milk after the first few weeks of life, starting with one-tenth to one-eighth of a yolk and gradually increasing the amount so that a whole egg yolk is given at the end of the second month.

It is hoped that the above suggestions may be adopted by others and thereby add to their armamentarium another satisfactory formula for infant feeding.

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2. Hess, A. E., and Matzner, M. J.: The Value of Milk Acidified with Lemon Juice. J. A. M. A., May 17, 1924, p. 1604.

3. Hess, J. H.; Orange Juice and Egg Yolk Mixtures for Infant Feeding. Am. J. Dis. Child, June 1927, p. 1015.

## DISCUSSION

Dr. Gerald Cline, Bloomington: Dr. Woodward has presented a very interesting paper,—short and to the point. I think infant feeding brings up a point Dr. Davis brought up in his paper as to what our children are going to be in adult life.

I certainly think the story begins away back with infant feeding.

One thing about orange juice milk; it is simple. It is easy to use and it does the work. Lactic acid is harder to get in rural communities, but most everybody can get oranges.

I personally have not been a very big user of lactic acid milk and sour milks which orange juice belongs to. That again has been another wave in pediatrics. I imagine that this wave also is a little bit on the decline, that we are getting back again to a certain extent to just our ordinary whole milk mixtures, either diluted, or whole milk and our sugars.

Orange juice brings up another important factor, that of adding vitamin C to the milk, and we should see that we do not forget to give our babies this vitamin.

Dr. R. E. Cummings, Chicago: I would like to ask Dr. Woodward what success he has had over a long period of time with the administration of egg yolk in his formulas? I think it is to be highly recommended but in its use I have met with some difficulty. After having been on the egg yolk mixture for some time, either they lose their appetite for milk for some time or they break out in a rash usually on the face. This rash very soon clears up when the egg yolk is removed from the formula.

Dr. Orville Barbour, Peoria: As Dr. Cline has said, sweet milk is satisfactory in most cases, but it seems to me that with a certain percentage of babies, where concentrated feedings are required, acid milks certainly have their place.

I wonder if Dr. Woodward has used orange juice added to condensed milk, such as is being used by some pediatricians. I find a certain percentage of babies cannot handle acid milk of any kind. I have not tried the orange juice milk.

Dr. Lee Frech, Decatur: I want to congratulate the doctor on his paper. The use of orange juice to

my mind is a much better method, especially in very young babies, than the use of lactic acid. Of course the results there are supposed to be the same.

We have used a good deal of orange juice and a good deal of lemon juice, and quite a little lactic acid in our milk modifications.

We find the objection to lactic acid is within the first few days after beginning—you get more or less irritation of the kidney tubules, as will be shown by resulting examination of the urine. That does not occur in our experience with either orange juice or lemon juice. So far as the two are concerned, I cannot see any difference whether you use orange or lemon juice. To my way of thinking one is as good as the other. Lemon juice will have to be used, of course, in a smaller proportion than the orange juice. We usually use one teaspoon, one drahm to the 16 oz. mixture of milk; whereas, larger percentages of orange juice may be used than that.

This idea of using egg yolk is an excellent one. We have used it for a good long time and as Dr. Cummings brought out, you are apt to get some rash or irritation of the skin with egg yolk if you are using a high percentage of fat in your formulas. I can say that in our practice we overcome that by the reduction of our cream percentage in our formula when we add the egg yolk. In that way we get away from that proposition of the rash.

I think the method of using orange juice is a good one.

Another thing I want to mention is that orange juice sometimes, in some babies, is used to better advantage with dry milk than with fresh milk.

I don't know whether Dr. Woodward has had that experience or not, but with some of the dry milk it does go better at times than with fresh. Of course that depends upon the powers of resistance of the individual infant.

It can be used very nicely with evaporated milk also as we have tried that and used quite a little of it. But never use it with condensed milk under any consideration. The fact of the matter is, we never use condensed milk for infant feeding on account of the high percentage of sugar. I want to specifically condemn the use of condensed milk. That is, the so-called, sweetened, canned milk for the use of infant feeding.

Dr. King G. Woodward, Rockford: In regard to Dr. Cummings' question, I have had exactly the same experience with egg yolk as he has. I don't use it nearly as much now as I did two and a half or three years ago, because of the rash which frequently develops. Very frequently you get vomiting and I have also noted there is more constipation.

I have also had the experience of a youngster refusing the orange juice milk because of its sweetness. To remedy that I have decreased the percentage of orange juice and increased the percentage of water for a period of a week or ten days and have usually been able to put the infant back on the orange juice milk.

I think the percentage was about eight or ten cases, out of the 200 that I reviewed at random, that I removed from orange juice milk after a period of two weeks' trial, when orange juice was removed temporarily because the infants did not take sufficient food when sweetened to make a satisfactory gain in weight.

I have never added orange juice milk to condensed milk.

As to Dr. Barbour's question about acid milk being the cause of vomiting, it has been my experience that in the youngsters that cannot handle an acid milk, or orange juice milk, specifically, the cause of vomiting is not due to their inability to handle orange juice milk, as much as it is from some other source. Perhaps a pylorospasm or a pyloric stenosis.

Dr. Frech brought out the subject of lemon juice, which I have used very sparingly. I know Dr. Alfred Hess recommends that in preference to orange juice.

I was glad to hear him bring out the fact that the addition of the orange juice or lemon juice to a dry milk is used satisfactorily.

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## INTRA-URETHRAL CHANCRE, A CASE

PAUL Z. KOESUN, M. D.
CHICAGO

Judging from the small number of cases reported in literature, chancre of the urethra seems to be of extremely rare occurrence. For that reason the following case seems of sufficient interest to report:

### *Report of Case*

T. T., a Chinese man, aged 39, came to see me for the first time on October 10, 1929, in my private office, because of a sore on the inside of the urethra near the external opening which had been present for over a month. He also complained of slight burning at the head of the penis during urination. The infection began ten days following sexual exposure.

Upon the initial appearance of the sore the patient visited another doctor who prescribed and applied various local antiseptics but without obtaining any results.

He had been treated for gonorrhea several times, but never for syphilis.

Examination revealed a small oval ulcer situated on the right lateral wall of the fossa navicularis. It measured 4mm x 5mm in diameters, deeply indurated, hard, and not painful. The edges were smooth, regular, and had very little secretion on its surface. No discharge could be expressed from the urethra. The first portion of urine was slightly flaky, the second portion was

clear. There were no inguinal adenitis, edema of the prepuce, nor other ulcerations present.

No attempt was made to look for the presence of spirochaeta pallida.

A tentative diagnosis of primary chancre was made and anti-syphilitic treatment was begun at once.

0.3 gm of neoarsphenamine was given intravenously with no reaction.

The patient was told to return on October 14. which he did. To satisfy my curiosity I took a blood Wassermann.

Dr. M. Molay of the Molay Medical Laboratory reported that the Compliment Fixation Test reacted to the patient's blood positive four (xxxx) plus, and the Kahn Precipitation Test likewise reacted positive four (xxxx) plus.

Another injection of neoarsphenamine, 0.45 gm, was given on October 18, and a third injection of 0.6 gm on October 27, and a fourth injection of 0.6 gm on November 5, and a fifth injection of 0.6 gm on November 15.

The chancre had healed and disappeared by this time.

The patient is still continuing the antisyphilitic treatment.

211 West 22nd Place.

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### TREATMENT OF PLACENTA PRAEVIA

In the January number of Surgery, Gynecology and Obstetrics, J. P. Greenhill, M. D., F. A. C. S., says:

I should like to urge that all patients who have a painless, causeless hemorrhage in the last trimester of pregnancy be immediately sent to a hospital without having a vaginal examination made and without a vaginal pack unless this is absolutely necessary. Because of paved roads, smooth-running automobiles, and the large number of accessible hospitals, there is seldom need to treat a patient with placenta praevia in her home or to pack the vagina before sending her to a hospital. I believe the best treatment for cases of central or partial placenta praevia is the low cervical cesarean section under local anesthesia. Blood transfusion should be thought of and used more frequently than it is today. In infected cases the uterus should be amputated after the baby is removed. For cases of marginal placenta praevia and for a certain proportion of cases of partial placenta praevia, the older methods such as rupture of the membranes, with or without vaginal tamponade, Braxton Hicks version, and metreurysis should be employed. As De Lee points out, in former years when confronted with a case of placenta praevia, we first thought of the old methods of treatment and only lastly of cesarean section. Now the process is reversed, for we usually think of cesarean section first.

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### RAGWEED DERMATITIS: WITH SENSITIZATION AND DESENTIZATION PHENOMENA

Marion B. Sulzberger and Fred Wise, New York (*Journal A. M. A.* Jan. 11, 1930), report a case of ragweed dermatitis in a man who gave completely negative reactions to all tests by the scratch method and did not show the slightest utricarial reaction to any of the substances employed, while he was strongly positive to ragweed when applied by simple contact. After a number of injections of allergen by the intradermal route, the patient's skin no longer gave a positive reaction to contact with ragweed allergen, and the dermatitis had improved.

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### A NEW ONE

Mule—What are you?

Ford—I'm an automobile.

Mule—Gwan! If you are an automobile I'm a horse. —Times of Cuba.

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## Society Proceedings

### ADAMS COUNTY

The monthly meeting of the society was held on Monday, February 10, 1930. The meeting was called to order at 8:20 p. m. by the president with 34 in attendance.

The program was a symposium on obstetrics conducted by the members. The following read papers.

The Normal Obstetrical Case, A. Germann, M. D.

The Toxemias of Pregnancy, C. A. Wells, M. D.

The Dystocias of Labor, M. E. Bitter, M. D.

Placenta Previa, Ralph McReynolds, M. D.

The Value of X-Ray Pelvimetry in Obstetrics (lantern slides), Harold Swanberg, M. D.

Discussion of this symposium was led by Doctor William Rankin of Keokuk and followed by Doctors Jurgens, Harris, Beirne, Stevenson, Knox, Nickerson, A. H. Bitter and finally closed by the essayists of the evening.

A motion made by Doctor Nickerson that a rising vote of thanks be given Doctor Rankin for coming to Quincy to lead the discussion on the symposium, was carried.

The secretary stated the plans of the program committee who recommended that an all-day meeting be held this fall and that we endeavor to secure a group from Cleveland, headed by Doctor George Crile to conduct the meeting. The plans of the committee were approved.

Doctor Harris called the attention of the society to the editorial in this week's J. A. M. A., relative to the narcotic situation. Doctor Wells made a motion that the secretary be instructed to communicate with our United States Senators and Congressmen-at-Large and

voice a protest against the Porter Bills. Motion was carried.

The meeting adjourned about 11:20 p. m.

HAROLD SWANBERG, M. D.,
*Secretary.*

### ALEXANDER COUNTY

The Alexander County Medical Society held its February meeting at the Halliday hotel, Cairo, Friday night the 21st with the following members and visitors present: Dr. P. H. McNemer, Dr. O. M. Dickerson, Dr. James S. Johnson, Dr. H. A. Davis, Dr. R. M. Young, Dr. Homer Chambliss, Dr. R. V. Rife, Dr. O. T. Hudson, Dr. Flint Bondurant, Dr. J. M. McManus, Dr. J. K. Rosson, Dr. R. E. Barrows, Dr. Edward Miller and Dr. James W. Dunn.

Dr. Hudson of Mounds, and Dr. McNemer of Cairo presented interesting cases that were discussed fully by the members. Dr. Bondurant presented a very able paper on the subject, "Some Practical Points in Handling Injuries." In this he discussed exhaustively the subject of practures, especially of the skull, and offered many valuable suggestions in caring for all kinds of wounds.

A communication from Dr. Andy Hall, of Springfield, Ill., director of health of the state, asked for the privilege of bringing Dr. C. P. Coogle of the United States Public Health services before the society for a discussion of malaria on March 26. The members voted to hold the meeting as suggested and to extend a special invitation to all physicians in the surrounding territory.

JAS. W. DUNN,
Secretary.

### COOK COUNTY

*Chicago Medical Society Joint Meeting with Chicago Society of Industrial Medicine & Surgery, February 5.*

Ununited Fractures; Etiology and Treatment—M. S. Henderson, Mayo Clinic, Rochester, Minnesota. Discussion: C. W. Hopkins, LeRoy P. Kuhn and S. B. MacLeod.

Diabetes—Surgical Aspect, George L. Apfelbach; Medical Aspect, Robert W. Keeton; Discussion, R. W. McNealy.

*Regular Meeting, February 12*

Cancer—Dr. J. P. Simonds, Department of Pathology, Northwestern University.

*Regular Meeting, February 19*

Malaria—Diagnosis and Treatment, Dr. C. C. Bass, Dean of Tulane University of Louisiana, New Orleans, Louisiana. Discussion, Eugene S. Traut and Charles A. Elliott.

### KANE COUNTY

The Kane County Medical Society meeting was held at Aurora, Leland Hotel, Feb. 12. Fifty-six members present. Dr. E. L. Lee, president, presiding. Dr. F. O. Frederickson spoke a few words regarding H. R. Bill 7884, urging protest against its passage.

The scientific program was presented by Dr. A. J. Larkin, of Northwestern University, who spoke on "Radium in Everyday Practice," and Dr. C. H. Warfield, Roentgenologist, Cook County Hospital, who talked on "X-Ray as an Aid in Diagnosis." A series of instructive slides was shown. Both papers enthusiastically received.

## Marriages

ELDRIDGE A. MCINTYRE, Mendota, Ill., to Miss Catherine D. Barrett of Princeton, Dec. 28, 1929.

RICHARD A. NAGLE to Miss Catherine Elizabeth Clark, both of Chicago, February 15.

## Personals

Dr. and Mrs. Isaac F. Harter, Stronghurst, recently celebrated their fiftieth wedding anniversary.

Dr. George S. Edmonson, Clinton, was recently appointed superintendent of the Kankakee State Hospital, Kankakee.

Dr. Victor H. De Somoskeoy, La Plata, Md., has assumed his duties as public health officer of Jacksonville, it is reported.

Dr. Ralph A. Kinsella addressed the St. Clair County Medical Society, East St. Louis, February 6, on "Recent Studies of Rheumatism."

Dr. Major Worthington, Geneva, has assumed his duties as managing officer of the Research and Educational Hospital, Chicago, succeeding Louis F. Wilk.

The Will-Grundy County Medical Society was addressed, January 29, Joliet, by Dr. G. Henry Mundt, Chicago, on "Social Aspects of the Practice of Medicine"; February 5, by Dr. H. Bascom Thomas, on "Work for Crippled Children"; February 12, by Dr. W. F. Peterson of Chicago, on "Protein Therapy" and on February 19, by Dr. R. W. McNealy on "Fractures of the Pelvis and Complications."

The Chicago Laryngological Society was addressed, February 3, by Josef Fischer, Vienna, Austria, on "Pathogenesis of Cholesteatoma," illustrated.

Dr. Abraham F. Lash, Chicago, addressed the Rock Island County Medical Society, Moline, February 11, on "The Treatment of Puerperal Infections."

Dr. Louis J. Smith, Chester, has been appointed physician at the Southern Illinois Penitentiary to succeed Dr. George Hoffman, who re-

signed after having held the position for ten years.

Dr Stephen d'Irsay, Johns Hopkins University School of Medicine, Baltimore, lectured at the University of Chicago, February 3, on "Research Facilities in the Eighteenth Century."

Dr. Daniel T. Quigley, Omaha, addressed the Chicago Roentgen Society, February 13, on "How Shall Modern Science Orient Cancer?"

The Whiteside County Medical Society, Sterling, was addressed, February 20, by Drs. G. Henry Mundt and Frank M. Phifer on "Otitis Media" and "Complications of Gonorrhea in the Male," respectively.

Dr. George Dick has resigned as chief of the department of medicine at the Evanston Hospital and will be succeeded by Dr. James G. Carr, Jr., professor of medicine at Northwestern University.

The sixth Lewis Linn McArthur Lecture of the Billings Foundation given before the Institute of Medicine of Chicago, February 28, at the City Club, by Dr. Alexis Carrel of the Rockefeller Institute for Medical Research, New York, on "The Process of Wound Healing."

Dr. George Gellhorn, professor of obstetrics and gynecology, St. Louis University School of Medicine, will give the annual Bacon lectures in the library of the University of Illinois College of Medicine. The first lecture will be given March 6, on "The Use of Local Anesthesio in Gynecology"; the second, March 7, on "Syphilis of the Uterus."

Dr. Louis N. Katz, assistant professor of physiology, Western Reserve University School of Medicine, has been appointed physiologist and director of cardiovascular research at Michael Reese Hospital. The cardiovascular group of the clinical staff will concern itself at first mainly with problems having to do with angina pectoris and coronary artery disease, but other studies will also be made. Dr. Katz will assume his new duties about April 1.

## NEWS NOTES

—The Chicago Society of Industrial Medicine and Surgery was addressed by Dr. Melvin S. Henderson, Mayo Clinic, Rochester, Minn., February 5, on "Ununited Fractures: Etiology and Treatment"; Drs. George L. Apfelbach, Robert W. Keeton and Raymond W. McNealy discussed diabetes.

—A joint meeting of the Institute of Medicine and the Society of Medical History of Chicago will be addressed, March 28, by Dr. Francis R. Packard, Philadelphia, on "William and John Hunter, a Study in Contrasts," illustrated.

—Clarence W. Muehlberger, Ph. D., has been appointed professor of toxicology and pharmacology at Northwestern University and assistant director of Chicago's new scientific laboratory for the detection of crime affiliated with Northwestern University. He has recently been the state toxicologist of Wisconsin and professor of toxicology in the state university at Madison.

—The Chicago Gynecological Society addressed at the Murphy Memorial Hospital, February 21, by Drs. William C. Danforth and Robert M. Grier on "An Analysis of One Hundred and Twenty Low Cervical Cesarean Sections," and Dr. Frederick H. Falls, "Observations on the Use of Local Anesthesia in Gynecologic Operations."

—The Chicago Pathological Society was addressed, February 10, among others by Dr. William Bloom on "Structure of the Lung and Its Implication in Inflammation"; Paul H. Harmon, "Pathologic and Symptomatic Observations on Animals Inoculated with the Virus of Poliomyelitis," and Dr. R. H. Jaffe. "Tubercle-Like Structures in Human Goiters."

—The greatest prevalence of tularemia recorded for any one year in Illinois was in 1929, when, up to December 10, seventeen cases had been reported. All but three of the cases occurred in the southern section of the state; in most instances, rabbits were given as the source of infection.

—The University of Chicago announced, January 21, that tuition in all departments of the graduate schools of arts, literature and science will be raised from $30 to $100, and in the law and medical schools from $100 to $125 beginning with the summer quarter. The change is said to be for the purpose of providing means to increase the salaries of professors and instructors.

—Dr. Charles A. Elliott, Chicago, was the guest of honor at a dinner given by the Vermillion County Medical Society at the Hotel Wolford, Danville, February 4. A scientific pro-

gram followed the dinner, at which Dr. Elliott gave an address on "Observations Concerning the Treatment of Diseases of the Liver." While the physicians were holding their meeting the Woman's Auxiliary to the Vermillion County Medical Society, with representatives from various local women's organizations, had a dinner, following which an illustrated talk, "Pink Pills for Pale People," was given by Dr. Arthur J. Cramp, director, Bureau of Investigation, American Medical Association.

—Following a trial of several weeks, at which about 1,800 pages of testimony and innumerable exhibits were presented, the medical committee of the state department of education and registration, January 23, found Henry Junius Schireson guilty of charges which the attorney general had made against him. In substance these charges were fraud, character unbecoming a physician, and gross malpractice. The present trial was the result of Schireson's responsibility in the case of Miss Sadye Holland, who suffered a double amputation following an operation for bow legs. The members of the medical committee, before whom Schireson was tried, were Drs. M. L. Harris, chairman, John R. Neal, Arthur H. Geiger, W. H. Gilmore and Gilbert Fitz Patrick, who unanimously recommended that Schireson's license be revoked.

## Deaths

Jesse Franklin Beabout, Casey, Ill.; University of Illinois College of Medicine, Chicago, 1928; aged 27; died suddenly, January 25, of heart disease.

James O. Bullock, Princeville, Ill., New York University Medical College, 1872, a practitioner in Lonaconing, Maryland, for 40 years, and resident of Princeville since 1920; aged 87; died at the home of his son, January 18.

Fred W. Carman, Geneseo, Ill.; Chicago Homeopathic Medical College, 1882; for several years member of the board of health; aged 71; died, January 6, at the J. C. Hammond City Hospital, of arteriosclerosis and myocarditis.

Malone Duggan, Danville, Ill.; University of Texas School of Medicine, Galveston, 1894; a former state health officer of Texas and assistant surgeon at the National Soldiers Home hospital; aged 61; died in the hospital at Danville, January 31.

Charles W. Goddard, Harvard, Ill.; Chicago Medical College, 1882; aged 72; died, January 16, of heart disease.

William P. Grady, Chicago; Rush Medical College, Chicago, 1902; aged 54; died, January 4, of coronary thrombosis and chronic nephritis.

David Decatur Grier, Gays, Ill.; Medical College of Ohio, Cincinnati, 1872; aged 80; died, January 29, at the Decatur and Macon County Hospital, Decatur, of cerebral hemorrhage.

Louis C. Koier, Chicago; Chicago Homeopathic Medical College, 1888; aged 65; died, January 4, of uremia and chronic nephritis.

Saul A. Koppnagle, Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1890; aged 70; died, February 7, of acute dilatation of the heart and chronic myocarditis.

Charles William Lenhart, Danville, Ill.; University of Louisville (Ky.) School of Medicine, 1911; connected with the Lake View Hospital, where he died, January 22, of pneumonia, age 57.

Charles Light McDonell, Chicago; Bennett Medical College, Chicago, 1914; aged 39; died suddenly at his home, February 6, of aortic aneurism.

Thomas Nunan Miller, Rockford, Ill.; Northwestern Medical School, 1880; aged 80; died at his home, January 14, of pneumonia.

John N. Nelms, Taylorville, Ill.; Cleveland College of Physicians and Surgeons, 1889; a member of Illinois State Medical Society and former officer of Christian County Medical Society; a practitioner in Taylorville for 40 years; active in locating the hard road system of the state; aged 73; died January 24, in St. John's Hospital, Springfield, following an operation.

Frank M. Neville, Canton, Ill.; Lincoln (Neb.), Medical College, 1901; aged 62; died, January 15.

Anny Marea Caroline Ernestine Petersen-Saunders, Oak Park, Ill.; State University of Iowa College of Medicine, Iowa City, 1912; formerly associated with the State Psychopathic Institute and the State hospitals at Dunning and Elgin; a member of Illinois State Medical Society; aged 42; died, January 1, at Davenport, Iowa.

Emmett Anthony Printy, Chicago; Northwestern University Medical School, 1915; a member of Illinois State Medical Society and Director of the Laboratory of Surgical Technique; aged 37; died, February 1, of a self inflicted bullet wound.

Wlfred D. Robbins, Chicago Heights, Ill.; Chicago Medical College, 1884; age 68; died, January 28, of heart disease and nephritis.

Charles F. Smith, Kankakee, Ill.; Miami Medical College, Cincinnati, 1878; a member of Illinois State Medical Society; a graduate in Law and Pharmacy; former member of city council and school board; active in civic and fraternal affairs; aged 79; died January 27.

Frederick W. Stahl, Chicago (licensed, Illinois, 1899); aged 69; died, Nov. 13, 1929, of myocarditis.

Louis L. Tinsman, Smithshire, Ill.; Rush Medical College, Chicago, 1886; retired from practice for several years; aged 74; died at his home, January 25.

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